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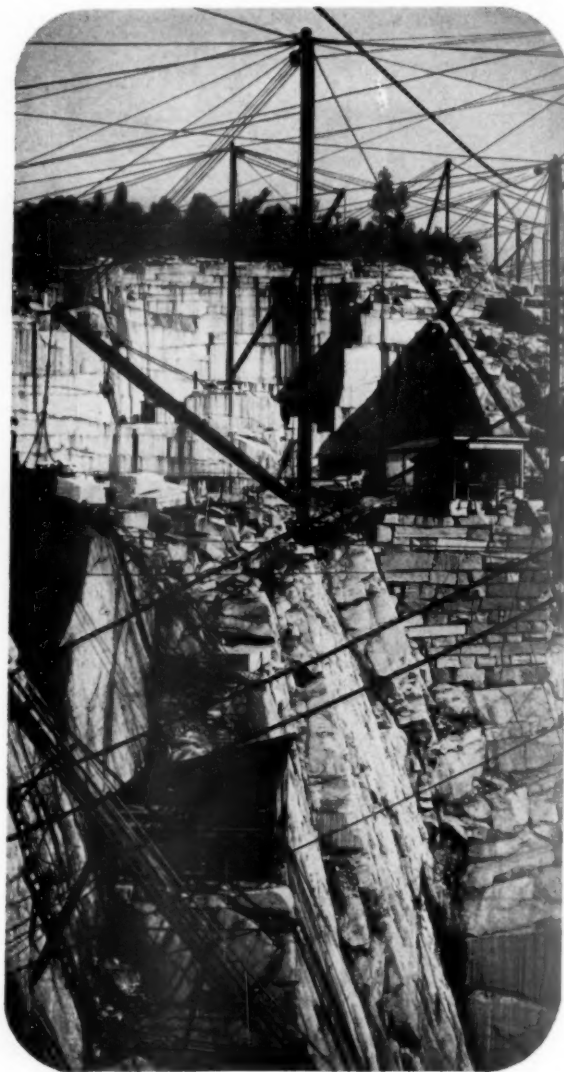
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JUNE, 1952

ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY



VOL. 55, No. 6

Bror Nordberg
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Editorial Consultant

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"WE HEAR..."

June, 1952

In violating wage stabilization regulations by overpayment in wages, contractors may have their entire payrolls disallowed (not just the overpayment) as a deductible item for income tax purposes, as was reported in Road Builders' News in an article reviewing a speech given at a recent meeting of the Michigan Road Builders' Association, by Francis J. Kelley, general counsel of the American Road Builders' Association and chairman of the Regional Enforcement Board, Region No. 4, W.S.B.

Mr. Kelley warned that wage increases in the construction industry cannot be legally made without specific authorization. Although certain limited increases are provided for by the regulation, in the majority of cases approval by the Industry Stabilization Commission is required. He urged employers to check carefully the payment of any wage exceeding the level prevailing on July 26, 1951.

Missouri Pacific Lines reports that of every dollar received from the public for rail transportation services in 1951, 83.1 cents came from freight service; 8.7 cents from passenger service; 3.1 cents from mail service; 0.8 cents from express service; and 4.3 cents from other sources.

Direct private U.S. investments abroad are said to have increased from \$8.6 billion in 1946 to \$13.6 billion in 1950. Most of the increased investments were in Canada and Latin American nations which have received little or no U.S. government aid. The main reason given for the increases is that the investment environment in these nations is sufficiently favorable so that returns are large enough to justify the risks.

Companies which use dynamite in their operations should make sure they have a safe and secure place for its storage to avoid the experience of two Kansas companies which recently reported thefts of dynamite from their quarries. About 200 lb. of dynamite and 600 caps were stolen from one quarry and 160 sticks of dynamite, 30 with caps and fuses attached, plus 50 cases of caps were stolen from the other quarry. In both cases, padlocks had been broken to obtain the dynamite.

A law to tax gypsum was recently passed by the Nova Scotia legislature. The gypsum bill calls for a 6 cent a ton tax on the crude product. The law went into effect May 1 and will last for ten years.

Farmington Valley, Conn., officials recently announced a plan to operate a town-owned gravel bank which, they claimed, if carried through, would save over \$25,000 of the taxpayers' money. An option has been obtained to purchase the proposed property and permission requested to install a railroad spur. The gravel would be used by the town's highway department.

Plans for a 2000-mile Mississippi river scenic parkway route, extending from near Canada to the Gulf of Mexico, are in progress, according to a recent announcement by the American Society of Civil Engineers. If carried out as planned, an estimated 60 percent of the Mississippi River Parkway would utilize existing primary and secondary roads which would be converted to parkway standards. This, coupled with new construction, would provide a continuous parkway at a minimum cost. Success of the enterprise is said to depend on the ten states affected, as well as the federal government.

WE HEAR

Using rice hulls in concrete block, making wallboard from sawdust and using waste radioactive materials to sterilize foods are examples given in a recent article of the Journal of Southern Research on utilizing waste materials.

* * * * *

Discovery of potentially significant deposits of uranium in the Pumpkin Buttes area of the Powder River Basin in northeastern Wyoming was recently announced by the Geological Survey. The extent of the deposits and the reserves of uranium ore they contain, as yet, have not been adequately determined. The Geological Survey feels that the number and grade of deposits found so far is encouraging, but whether the find may be classed as a major discovery remains to be proved by additional field work and drilling.

* * * * *

The Virginia State Senate recently passed a bill limiting the production of concrete and cinder block and brick, by prison labor, to their present capacities, and requiring that the products be used in state-supported institutions.

* * * * *

Total construction awards for the first quarter of 1952 for the 37 states east of the Rockies amounted to \$3,108,551,000, which was a decrease of 10 percent compared with the first quarter of 1951, according to an F. W. Dodge Corp. report. Nonresidential awards of \$1,222,356,000 were down 18 percent; residential awards of \$1,326,876,000 were down 13 percent, while public and private works and utilities at \$659,319,000 were up 17 percent.

* * * * *

Of the federal government's proposed \$85.4 billion budget for 1953, more than \$6 billion is earmarked for research, education and various developmental programs. This includes money to be spent on conservation, aid to education and on atomic energy.

* * * * *

The defense production administrator, in announcing the steel allocations for the third quarter of 1952, stated that sufficient allocations have been provided to carry forward all public road projects which have either received earlier allocations or were started before controls were put into effect, but the start of new projects is prohibited. In the first quarter of 1952, only 27.9 percent of the amount of structural steel required was allocated; the second quarter allocations increased to 34 percent of requirements, while the third quarter allotments are expected to increase to 64 percent of structural steel requirements.

In the field of industrial expansion and commercial construction, allocations for the third quarter have been made to carry forward all construction projects that have received allocations in the second quarter, with some provision made for the start of new construction projects.

* * * * *

American railroads moved an average of 21,767 net ton-miles per freight train hour in 1951, which was said to be the highest average on record. Another record was established in the number of freight cars per train which averaged 59.8 cars per train.

* * * * *

A new construction product for highways, sidewalks, driveways and houses has been invented by a North Carolina business man. The new product is called "Plas-Mo-Falt" with its principal ingredient being blackstrap molasses. The molasses when mixed with a heavy residual bunker fuel oil to make a synthetic asphalt, is said to produce a hard, insoluble road and street paving material. If mixed with clay and sand, the solution will bind the particles together to make a strong plastic adobe building block. The product is also claimed to be fireproof, windproof, waterproof, termite-proof and economical in cost. A new plant is to be built to produce about 10,000 lb. per hr.

* * * * *

Heavy construction awards totaled \$4,496,610,000 for the first 18 weeks of 1952, as compared with \$5,258,420,000 for the corresponding period of 1951, as reported by Engineering News-Record. Private housing awards, however, are continuing to run ahead of the 1951 awards in this category. The 18-week cumulative total was approximately \$1,008,200,000, or 41 percent above the 1951 figure.

THE EDITORS

E

ditor's

page.....

Outlook for Highways Is Looking Up

The nation-wide good roads movement now gaining momentum is bound, sooner or later, to overcome the obstacles to a realistic highway construction program in order to save our transportation system. While the federal administration has been continuing its opposition to provide adequate federal aid, the movement is being carried to the public. They are being educated to the costs of modern highways, the extravagance in a policy of patchwork maintenance, the economic penalties and loss of life resulting from driving over inadequate highways, and to the misuse of funds appropriated for the purpose of highway building.

The public is getting fed up with the serious problem of congestion and resulting losses, both economically and in human life, and its desires will be felt in the state legislatures, where the bulk of the funds must be provided. Individual key states require as much as one, two and even three billion dollars worth of work, according to careful surveys, and the federal aid system alone is estimated to need expenditure of three billion dollars annually over a ten-year period to bring it up to date. Minimum needs over-all would total from five to six billion dollars a year for 15 years.

Public Demand

It's only a matter of time before a growing demand by the public for better roads will make the funds available. The approach being followed, in education of the people, by substituting practical facts and values for politics, is going to do the trick. Road building constitutes one vast project about which there can be no question of values as they benefit the American people in dollars received for the investment.

As far as financing is concerned it might be a good idea to repeal federal excise taxes and turn that function over to the states. After all, only a small percentage of federal excise taxes has been used for highways since 1930 and if equivalent funds be made available to the states, at least that much might be put to proper use in building roads and not be spent for something else. With the increased federal tax and the greatly accelerated use of the highways, that source of revenue would be sufficient to put the federal aid highway system in order.

There is a feeling that general business is starting a decline and there is much concern as to the effect on "prosperity" when heavy defense spending is finished a year or two hence. In view of

this anticipated economic downturn, the timing of the better roads campaign should help its own cause, as a means of taking up the slack. It has been said by competent authorities that highways and affiliated interests account for one-seventh of our national income. Highway building has been used as a pump-priming device before.

Rational Planning

Regardless of how much money will be appropriated, progress is being made through sufficiency ratings whereby structural condition, safety and traffic service will determine the order and magnitude of work to be undertaken within the limits of funds available.

Furthermore, technical data are being developed under service conditions that will influence pavement selection and design for maximum and most economical service. The Maryland test road has proved that overloaded trucks have detrimental effect on the life of concrete pavements as designed and built for purpose of the tests. We now have the Idaho test road project which will develop similar data for asphaltic concrete pavement.

Both test roads constitute a scientific attempt to settle the argument between highway builders and truckers as to how much damage heavy trucks do to roadways. Results of tests on roads of varying thickness subjected to varying weights and which are subject to freezing and thawing in actual service, and with differing subbases will be available to highway engineers for guidance.

These two test programs will provide data to guide in the selection of type of design for maximum axle loadings on present and future highways, will demonstrate maintenance costs on highways of varying thickness, will determine whether roads are being over-designed or under-designed, and provide useful information in fixing load limits and in apportioning costs.

Whether the answers be in thicker pavements yet or thicker road-bases, or both, it is likely that "reasonably" heavy trucks will be designed for and that the producers of aggregates and other road-building materials can look for greatly expanded markets.

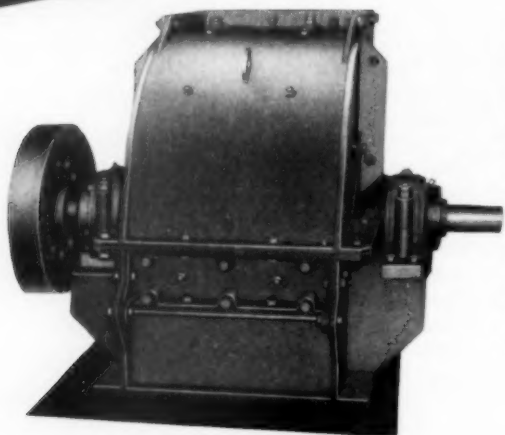
Bron Nordberg



**ROGERS
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Jaw Crushers

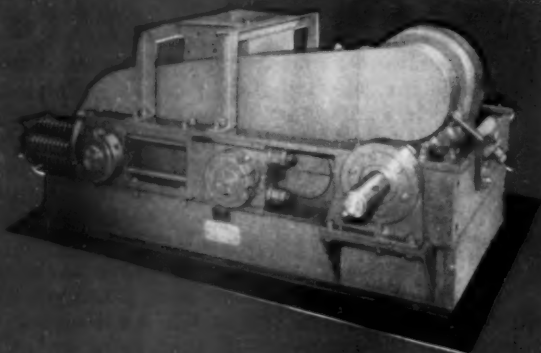
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- Mine Hoists
- Vibrating Screens
- Elevators

Rocky's NOTES

Nathan C. Rockwood

Really All in the Same Boat!

LABOR IN OUR CHANGING ECONOMY" is the title of a paper delivered February 27 to the Institute on Business and Economic Problems, at the University of Pittsburgh, Penn., by Melvin H. Baker, chairman of the board of directors of the National Gypsum Co. It is particularly apropos to the conditions existing this first of May, when this article is being written. Mr. Baker has not only had a great deal of experience, but he is a good deal of a philosopher, so that he has learned and can continue to learn from his experience. The following three paragraphs from his address we believe are highly significant:

"Some authorities have described the growth of labor organizations as taking place in three stages. During the first period, the workers organized by crafts to create collective force for action through loyalties to their trades. During the second stage, labor pressed its demands on management and gained acceptance of collective bargaining. Finally, the third phase, not yet completed, is one in which the labor organization would be accepted by management for economic planning.

"A review of what's happening indicates we are well along on the second stage of this evolutionary process. The best evidence of this is acceptance of collective bargaining as indicated by over 100,000 negotiated agreements now in effect. There is, however, an air of armistice about these agreements. They mark a period in most companies of temporary peace during which both sides gird for further resistance.

"It is the challenge before us, then, to find ways to further the relationship into the third stage where there will be a mutual desire to create advantages for both labor and management alike."

Long-Range Outlook

It would be discouraging to all of us if we lacked faith in a happy ending to the long-range objective. Judge Pine, in his decision in the steel industry government seizure case, has clearly and forcefully restated the

fact that our federal government was designed as a system of checks and balances to insure a government of laws rather than a government of men. Hitherto, the men who in times of crisis have felt it necessary to stretch the point have been men in whom the public had enough confidence to believe that they would relinquish their extraordinary power as soon as they could safely do so. It's good for all of us to be reminded that the courts are still functioning in instances where such public confidence appears to be lacking.

Can't Beat Economic Law

What hasn't been made equally clear to the general public is that our unseen, intangible economic government is also on a system of natural laws based on checks and balances, which every once in a while gets out of whack.

As Mr. Baker pointed out in his address, labor unions and collective bargaining were necessary counterbalances to the growing domination of the national economy by giant corporations. But when the federal government during the last 20 years threw all of its weight to giant labor organizations, the economy got out of joint in the reverse direction as much as it had before.

The administration of laws must be by men, and men of invariable justice are exceedingly rare. Even such laws as the National Fair Labor Standards Act, and the biased National Labor Relations Act could be administered in fairness to all concerned; but they seldom have been. Similarly, a tri-party board, to settle the steel industry's wage dispute, could have handled the issue fairly to all concerned, and it would then have been in a position to justify its decision in the court of public opinion. Moreover, it could have rendered an exceedingly valuable public service by explaining in every-day language the interplay of economic forces, and the disastrous results to all of us when they get too far out of balance.

Those who remember the 1920's and aftermath in the 1930's, know

that the prime cause was an inflation of security values. Money, or credit was too easy to get, and the demand for commodities seemed inexhaustible, so productive facilities were expanded rapidly, regardless of cost. Commodities and facilities to produce them have value only so long as people will buy. There eventually comes a time when even the spend-thrift has enough, at least for the time being, just as we reach a point in eating where our stomach can stand no more. There comes an inflation of productive facilities, and the commodities and facilities to make them lose their values, again temporarily.

The 1930 depression was hastened because a large segment of the population, the farmers, did not keep pace in spendable income with wage and salary earners, and those who thought they were getting rich from security trading. To be sure, in the last twenty-odd years the politicians in government have tried to take care of the farmers as well as wage earners, but they have overlooked a large and equally important segment of the population, the thrifty souls, who are dependent on the income from their own businesses and their savings. They are important, because without them there would be no American enterprise as we know it. They include not only millions of individual stock or share owners, but a score times that number or more whose savings are indirectly invested in American enterprise through insurance companies and trust funds.

More and more wage earners are coming to have a stake in such investments, for there is no other place to put the funds from which they expect to draw pensions in their old age, or sick and death benefits. With every economically unjustified wage and price increase, they are not only reducing the real benefits from these invested funds, which in the last analysis are very largely theirs, but they are endangering the whole structure, which can collapse, just as it did in the 1930's.

Then, of course, the unbalancing of the economy hurts in other ways, since it spurs producers and manufacturers to constantly substitute automatic devices for man-manipulated ones. If labor could be compensated fairly for this increased per man hour productivity, everything would be in balance, but when wages go beyond this we are merely piling up troubles which will eventually have to be washed out in very unpleasant ways. Wages can be, and probably are now, inflated just as security or investment values were inflated in 1930. They will stay inflated just so long as demand for labor exceeds current supply. They can't stay inflated indefinitely, even under the artificial stimulus of the "defense crisis."

What is needed, as inferred from

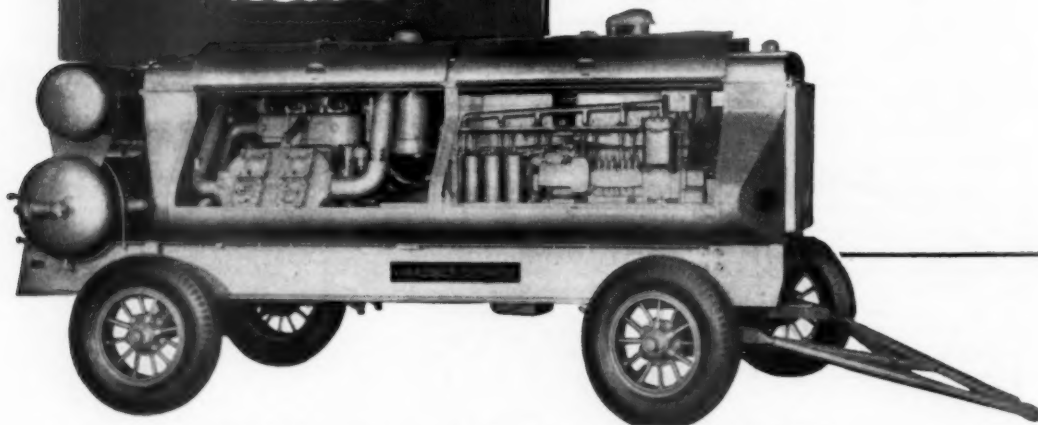
(Continued on page 153)

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LABOR RELATIONS TRENDS

Preparation of Asphalt Mix for Highways is Interstate Commerce; Employer's Responsibility for Acts of his Superintendent

By NATHAN C. ROCKWOOD

PRODUCERS OF LOCAL highway construction materials have always been more or less in the dark as to the application of the Fair Labor Standards Act to employees engaged in producing sand, gravel, crushed stone and ready-mixed concrete which do not move in interstate commerce, but are used for construction and repair of highways. The administrator of the F.L.S.A. has always contended that all such local materials when used for repair, maintenance or reconstruction of streets and highways in connection with interstate commerce came within his jurisdiction. Since almost all streets and highways connect with interstate routes, the coverage can be rather broadly interpreted.

The first case to be tried in the federal courts became famous because the National Sand and Gravel Association stepped in to assist the defense of an Oklahoma crushed stone producer. This, as our readers and the members of the association will recall, was the E. C. Schroeder Co. case, which was won by the producer in the U.S. Circuit Court of Appeals, 10th Circuit, in 1945, insofar as employees engaged in the production of crushed stone for a trunk highway were concerned.

The catch in this decision, however, was that the court considered the construction of a new cutoff, for which the stone was furnished, constituted a local construction project, since until it was completed, it could not be considered "an instrument of interstate commerce," as referred to in the F.L.S.A. Later, in 1948, the same producer lost a similar case, for an overtime wage liability incurred at the same time (1945), because these particular employees were engaged in supplying stone for a flood-protection dike around some oil tanks. Since the oil entered into interstate commerce these employees were held to come under the act. (For an analysis of the two Schroeder Co. decisions see *Rock Products*, August, 1948, page 89.)

There is a U.S. District Court decision in a case very similar to the one we are about to record here, where a crushed stone producer furnished material to county authorities for the maintenance of interstate highways. This was *McComb (F.L.S.A. administrator) vs. Trimmer Co., Flemington, N.J.*, decided July 26, 1949 (see *Rock Products*, September, 1949). The court decided: "The business in which the defendant's employees are engaged is local in nature. Ultimately its product will

be employed upon highways carrying interstate commerce. There is no immediacy to commerce on its part. . . . There is no more reason to say that it is engaged in the production of goods for interstate commerce than to say that it is engaged in commerce. It comes strictly within the classification well adopted by other courts of 'off the road' employees who are not contemplated for coverage by the act." So far as we know the F.L.S.A. administrator did not appeal this decision.

Apparently, the defendant in the present case used this decision, for his attorney specifically used the "off the road" argument. In the New Jersey case cited the county sent its own trucks to pick up the crushed stone, while in the case discussed in what follows, the producer of the asphalt mix apparently used his own trucks and his own employees to spread the mix on the highways. He did not claim exemption for the men at work on the road, but argued that his plant employees were exempt. As you will see from the decision of the Circuit Court of Appeals, he lost out on this contention, the court upholding a U.S. District Court decision. This decision leaves the general issue as much up in the air as ever, since apparently a similar case can go either way with slight changes in the setup.

Amesite Case—Text of Decision

The U.S. Circuit Court of Appeals, Third Circuit, Philadelphia, Penn., rendered the following decision April 9, 1952, in the case of *Tobin, etc. vs. Alstate Construction Co.*, on an appeal by the defendant from a decision by the U.S. District Court for the Middle District of Pennsylvania:

"Where an employer is engaged in the production and application of a bituminous material used in the repair and maintenance of highways over which interstate commerce moves, are those off-the-road employees who perform work essential to the production of the material 'engaged in commerce or in the production of goods for commerce' within the meaning of the Fair Labor Standards Act of 1938?

"The question is presented by the instant appeal from the judgment of the District Court for the Middle District of Pennsylvania enjoining violations by Alstate Construction Co. ('Alstate') of Sections 15 (a) (2) and 15 (a) (5) of the Act, 52 Stat. 1060, as amended, 29 U.S.C. § 201 et seq. The facts are stated in detail in the opinion of the court below,

95 F. Supp. 585. They may be summarized as follows:

"Alstate is engaged in the production, sale, distribution and application of a bituminous concrete material, known as amesite, which is used to resurface and repair streets, highways, railroad crossings and industrial facilities. The material is processed at three plants, located in Pennsylvania, and then applied by Alstate's employees. During the period under consideration (June 30, 1945, through June 30, 1948) over 85 percent of the material was used (1) on interstate roads or roads carrying interstate traffic, or (2) by interstate railroads or industrial concerns producing and shipping goods in interstate commerce. Alstate employs various classes of employees at its plants and at the site of its operations. Laborers rake the amesite on the highways; at the plants, off-the-road employees, including mixers, firemen, watchmen and clerks perform tasks essential to the production of the material. Most of these employees are regularly employed in excess of 40 hr. per week without receiving overtime wages, in violation of the act; prior to January 1, 1948, Alstate failed to keep proper records as required by regulations promulgated under the act.

"This action was brought by the administrator to enjoin continued violations. In the proceedings below, most of the facts were stipulated by the parties, and additional testimony was submitted. The district court concluded 'that the various plants of the defendant were all component parts of an integrated unit, 85½ percent of whose total output was directed toward the improvement of various interstate facilities, and that all of the employees of the defendant are definitely within the scope of the statute.'

Employer's Defense

"Alstate concedes that those of its employees who actually apply the amesite to the highways or other instrumentalities of commerce are within the scope of the act; but contends that its off-the-road employees, i.e., the mixers and other plant employees who produce the amesite, do not have such immediacy of participation in interstate commerce so as to bring them within its coverage. We cannot subscribe to this contention.

"While the precise question has never been passed upon by an appellate court, analysis of the language of the Supreme Court in recent cases arising under the act leads inevitably to the conclusion that coverage was intended for off-the-road employees such as are here involved. By its terms, the act applies to all employees 'engaged in commerce or in the production of goods for commerce'. This clause was construed by the Supreme Court, in *Roland Electrical Co. vs. Walling*, 326 U.S. 657, 663

(Continued on page 154)

New Jersey is booming these days and that calls for lots of aggregate to particular specifications.

F. & M. DiMaggio Co., Paramus, N. J. is among New Jersey producers who happily installed Eagle Equipment. They use a 36" x 22' Eagle Fine Material Washer with 30" dia. screw flights to wash, classify and dehydrate sand—over 400 yds. pit run material processed daily—300 g.p.m. wash water used from pond. Material chuted from screen to washer is $\frac{1}{8}$ ".005. "No complaints" say the DiMaggios.



NEW JERSEY PRODUCERS PROFIT WITH EAGLE WASHERS, TOO!



Seaville Sand & Stone Co., Palermo, N. J. uses an Eagle 29" x 18' Fine Material unit with 24" screw flights, to wash, classify and dehydrate a daily average of 200-tons of pit run material. As with the DiMaggios, the readily adjustable long Weir on the Eagle Washer gives them retention or wasting of fines as desired. Rising water currents in tub plus scouring action of screws assure clean material.

The size of the plant has no bearing—Eagle Washing and Classifying Equipment saves proportionately. Get the facts!



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Screw Washers



Log Washers



"Swivel" Dredge Ladders



Clay Crushers



Clay and Cinder Grinders



Shale Planers



Coal Crushers

PEOPLE in the news

Research Director

F. P. DIENER, chemical engineer of Universal Atlas Cement Co., New York, N.Y., has been appointed director of tests and research. He succeeds



F. P. Diener

George L. Lindsay, who died April 24. A native of Allentown, Penn., Mr. Diener was graduated from Lehigh University in 1920 with the degree of chemical engineer. He joined the company in 1924 as special chemist at the Northampton, Penn., plant where, in 1930, he became assistant chief chemist. In 1941, he was promoted to assistant general chemist at the New York office. He has been chemical engineer since 1943.

Heads New Division

JOHN O. PRITCHARD has been appointed head of the new process evaluation division, research department, of American Potash and Chemical Corp., New York, N.Y., according to an announcement by W. A. Gale, director of research.

Association President

GILBERT R. FULLER, vice-president in charge of sales for The Portsmouth Sand and Gravel Co., Portsmouth, Ohio, has been elected president of the Ohio Sand and Gravel Association, Columbus, Ohio, at a recent meeting of the association. E. P. Thomas, general manager of the Massillon Washed Gravel Co., Massillon, Ohio, has been named vice-president; and W. E. Pohlman, manager of American Aggregates Corp., Columbus, Ohio, has been appointed treas-

urer. Claude L. Clark is executive secretary of the association. Principal topics discussed at the convention were federal price and material controls, wage and hour regulations and taxation as affecting the sand and gravel industry. The discussion was led by Kenneth E. Tobin, Jr., assistant executive secretary of the National Sand and Gravel Association. William E. Hole, executive vice-president of American Aggregates Corp., Greenville, Ohio, led the discussion on taxation.

Plant Manager

F. E. PHIPPS, operator of Pamlin Sand and Gravel Co., Hamlin, Texas, for several years, has been named plant manager of River View Sand and Gravel Co., Imperial, Texas.

Named Vice-President

D. E. PROPER, former vice-president and general sales manager of Uvalde Rock Asphalt Co., San Antonio, Texas, has been appointed vice-president and general manager of the Pearl Brewery of San Antonio. A graduate engineer of Iowa State College, Mr. Proper joined Uvalde in 1923 as engineer and assistant general superintendent of construction. He became vice-president and general sales manager, which position he resigned when he was elected executive vice-president of the Texas Good Roads Association and publisher of *Texas Parade*. Since 1943 he has been in business for himself as wholesales commission agent for Continental Oil Co. Mr. Proper still serves as a director of the Uvalde Rock Asphalt Co., and is a member of the executive committee of the Texas Good Roads Association.

Elected Vice-President

MARVIN GREENWOOD has been elected a vice-president of The Celotex Corp., Chicago, Ill., in addition to his duties as general sales manager. He joined the company in 1925 and has served successively as assistant to the sales manager, manager of the St. Louis sales division, and assistant general sales manager. In 1939 he was appointed general sales manager. Allen Cassin, E. E. Dierking and E. C. Rautenberg have been named assistant general sales managers. Mr. Cassin will serve the East Coast territory, with headquarters in Washington, D.C. Mr. Dierking will serve the Middlewest, and Mr. Rautenberg, the Southern and West Coast territory, both with headquarters in Chicago.

Named Vice-President

HARVEY H. ALLEN, former assistant to the Texas state highway engineer, has been named vice-president and



Harvey H. Allen

director of The Featherlite Corp., Dallas, Texas, according to an announcement by Jack Frost, president of the company. Mr. Allen will be in charge of sales, engineering and production. Alex T. Mickle is executive vice-president.

Works Manager

J. W. BLEDSOE, formerly works manager of the Boston, Mass., plant of the United States Gypsum Co., Chicago, Ill., has been appointed works manager of the plant at Fort Dodge, Iowa. He succeeds R. D. Rudolph, who has resigned. A native of Sweetwater, Texas, Mr. Bledsoe is a veteran of 25 years' service with United States Gypsum Co. He began his career in the Sweetwater plant, later serving in the Chicago office and as works manager at the Detroit, Mich., plant.

Speaks on West Coast

O. H. SEEGER, general manager for Harry Wellnitz, Columbus, Ohio, and president of the Columbus Concrete Block Manufacturers Association, spoke recently on lightweight aggregate at a symposium on "Airfield Pavement for Jet Aircraft," sponsored by the Navy Bureau of Aeronautics at the Naval Engineering and Evaluating Laboratory near Oxnard, Calif. Mr. Seeger attended the conference at the invitation of the Sunnyside Aggregate Corp., New Lexington, Ohio.

Heads Medusa

ELLERY SEDGWICK, JR., has been elected president of Medusa Portland Cement Co., Cleveland, Ohio, and W. J. Worthy, vice-president in charge of production, has been named executive vice-president. Mr. Sedgwick, who resigned as vice-president of the National City Bank, succeeds the late Harry L. Berno, president and general manager, who died last November. He is a native of Boston and a graduate of Harvard University.

Executive Vice-President

LOUIS F. WEYAND has been elected executive vice-president of Minnesota Mining and Manufacturing Co., St. Paul, Minn. He has been a vice-president since 1946 and a director since 1950. George W. Swenson and Hubert J. Tierney have been appointed vice-presidents. B. H. Voss has been named vice-president of the roofing granules division in addition to his duties as sales manager for the division in Chicago, Ill. Robert W. Young, president of Minnesota Mining and Manufacturing International Co., a subsidiary that handles the firm's foreign business, has been promoted to chairman of the board, and C. B. Sampair succeeds Mr. Young as president of the subsidiary company.

Ideal Personnel Changes

ROBERT F. BLANKS has been appointed research consultant to Ideal Cement Co., Denver, Colo., in addition to his duties as vice-president and general manager of Great Western Aggregates, Inc., Denver. Charles S. Burriss, superintendent, Three Forks Division, Hanover, Mont., has also been appointed assistant plant manager, Three Forks Division, Trident, Mont. W. J. Conway, formerly sales manager of the Alabama division, has been appointed Pacific regional sales manager, with headquarters in San Francisco, Calif. H. H. Howle, who has been sales manager, Alabama division, has been named sales manager of the Louisiana division in New Orleans, La. H. R. Marriott, Jr., formerly a salesman in the Alabama division, has been appointed assistant sales manager, Alabama division, Mobile, Ala. Carroll Nordean has been made assistant sales manager of the Arkansas division, Little Rock, Ark. He was formerly a salesman for the Arkansas division.

Mining Consultant

WALTER RUKEYSER, New York mining consultant, left for Belgrade, Yugoslavia, recently to advise Yugoslav officials on the development of the country's asbestos deposits. Mr. Rukeyser's help was requested by the Yugoslav government through the United Nations' Technical Assistance Administration.



John A. Ruhling

Joins Pipe Association

JOHN A. RUHLING has joined the American Concrete Pipe Association, Chicago, Ill., as Washington representative. He was formerly manager of the personnel training department of the Portland Cement Association. Mr. Ruhling has had 30 years of experience in various fields of construction involving concrete structures. He received his engineering training at Armour Institute of Technology and held important assignments with the Sanitary District of Chicago, the Bridge Division of the Chicago Board of Public Works and the Atlas Portland Cement Co. A Navy veteran of World War I, he was administrative assistant to the general manager of the Century of Progress Exposition just prior to joining the Portland Cement Association in 1933 as a field engineer in the Milwaukee office. In 1944 he was appointed manager of the housing and cement products bureau in Chicago, and three years later became manager of technical personnel training.

Returns as Director

FRANK B. THACHER, president of Carbon Limestone Co., Lowellville, Ohio, has returned to Interlake Iron Corp. as a director, succeeding the late Leigh Willard, former board chairman. Mr. Thacher was associated with Interlake for 18 years and held the post of assistant general manager at the time he left the company in 1940.

Sales Manager

WALTER E. LORD, JR., Seattle sales representative for Kaiser Gypsum, Oakland, Calif., has been appointed Pacific Northwest sales manager. The district has been expanded to include Washington, Oregon, Idaho, British Columbia and Alaska.

Executive Vice-President

C. WARREN BLACK, vice-president of The Arundel Corp., Baltimore, Md., since 1940, has been elected executive vice-president in charge of engineering and construction.

Guest of Cement Official

D. S. COLBURN, executive vice-president of Marquette Cement Manufacturing Co., Chicago, Ill., who recently returned from an extended trip through the Orient, was host to Alexander V. Skvorzov, internationally prominent structural engineer who recently resigned as manager of the Hong Kong Engineering and Construction Co., Ltd., to locate in the United States. Under the sponsorship of Mr. Colburn, Mr. Skvorzov addressed the Chicago Engineers' Club on construction problems in the Far East as compared with those in the U.S. As manager of the Hong Kong Engineering and Construction Co., Mr. Skvorzov was chief architect and structural engineer for the company. A concrete specialist, he is an authority on the Franki compressed concrete piling system.

Defense Plants Advisor

J. HARPER FULKERSON, past chairman of the Manufacturers Division of the National Crushed Stone Association, has been appointed regional advisor for the Small Defense Plants Administration, Carbondale, Penn. Mr. Fulkerson, who is president of Cross Engineering Co., was appointed to this post by Gen. Telford Taylor.

Elected a Director

J. Y. MURDOCK has been elected a director of Canada Cement Co., Ltd., Montreal, Canada.

District Sales Manager

JAMES E. TAYLOR, assistant district sales manager of the Illinois-Wisconsin territory of Universal Atlas Cement Co., New York, N.Y., has been appointed district sales manager to succeed Charles L. Peyton who retired February 29. Born in Wilson, Kan., Mr. Taylor graduated from Cornell College, Mt. Vernon, Iowa. He joined the cement company as clerk in the Chicago territory sales office in 1940, leaving two years later for service in the Signal Corps of the U.S. Army. In 1947 he rejoined Universal Atlas as a salesman in the metropolitan Chicago territory, and in 1951 was appointed assistant district sales manager, Illinois-Wisconsin.

Mr. Peyton has retired after an outstanding career in the sales department of Universal Atlas. During the last four years, he has been district sales manager of the Illinois-Wisconsin district.

On Board of Directors

LEWIS R. SANDERSON, president of National Gypsum Co., Buffalo, N.Y., has been elected to a three-year term on the board of directors of the Western New York State Heart Association.

Traffic Manager

JAMES E. CHRISTIANSEN has been appointed traffic manager of Marquette Cement Manufacturing Co., Chicago, Ill. He was formerly associated with the traffic division of Universal Atlas Cement Co. where he was supervisor of transportation and later assistant traffic manager.

OBITUARIES

ERNEST F. HABERKERN, Sr., production manager for Columbia Quarry Co., St. Louis, Mo., died April 22. A mechanical engineering graduate of Notre Dame University, Mr. Haberkern was 40 years old at the time of his death.

HENRY A. HUSCHKE, formerly managing director of Agricultural Limestone Institute, Washington, D.C., died May 4 after an illness of several months. He was 51 years old. Mr. Huschke had been associated with the agricultural limestone industry for many years, starting as an agronomist with the National Lime Association. Before joining A.L.I. in 1945, he was with the agricultural chemical section of the Office of Price Administration during World War II. At



Henry A. Huschke

the time of his death, Mr. Huschke was chief of the agricultural chemicals section of the Rubber, Chemical and Drug Division of the Office of Price Stabilization.

JOHN CALVIN BUCKBEE, retired chairman of the board of Consoli-

dated Rock Products Co., Los Angeles, Calif., died April 27 at the age of 70. Mr. Buckbee, a well-known figure in the rock products and cement industries, was president of the J. C. Buckbee Co., Los Angeles, for 50 years. He was founder and a director of the Saticoy Rock Co., Ventura, Calif., and the Petoskey Portland Cement Co., Petoskey, Mich.

C. LAURENCE WARWICK, executive secretary of the American Society for Testing Materials, Philadelphia, Penn., died suddenly on April 23, shortly after presiding at a dinner honoring John K. Rittenhouse, retiring treasurer of the society. Mr. Warwick was 63 years old and had been active in A.S.T.M. since 1909 when he graduated from the University



C. Laurence Warwick

of Pennsylvania in civil engineering. While he was instructor and assistant professor at the university, he also served as assistant secretary of A.S.T.M. with Edgar Marburg, founder and secretary of the society. In 1919, on the death of Dr. Marburg, he was appointed secretary-treasurer (chief executive officer) and in 1946 became executive secretary. During World War II, Mr. Warwick served as head of the specifications branch of the Conservation Division of the War Production Board, and later headed the Materials Division. He was author of numerous technical papers and reports dealing with properties and tests of engineering materials and especially standardization of specifications and tests.

FRANCIS GRAHAM MCKELVY, chairman of the board of Alpha Portland Cement Co., Easton, Penn., died May 7 at his home "Oakhurst," in Easton, after an illness of several weeks. He was 68 years old. Born in Pittsburgh, Mr. McKelvy attended Shadyside Academy in Pittsburgh, was graduated from Lawrenceville School in 1900 and received his degree at Princeton University in 1904. He joined Alpha in 1906 as a clerk and sub-

sequently became purchasing agent and secretary. He was appointed second vice-president in 1914 and three years later was named first vice-president and then executive vice-president. In 1935 he was elected president and served until 1949 when he became chairman of the board. Elected to the Alpha board of directors in 1914, Mr. McKelvy served continuously until his death. He also served on the board of directors and executive committee of the Portland Cement Association and was elected chairman of the board in 1943.

GEORGE LEE LINDSAY, director of tests and research, Universal Atlas Cement Co., New York, N.Y., died April 24 after an operation. He was 55 years of age. A native of Michigan City, N.D., Mr. Lindsay was graduated in 1921 from the University of Minnesota with a B.S. degree in chemical engineering. During vacation periods he worked at the Duluth plant on construction and in the physical laboratory. Upon graduation, he rejoined the company as a chemist at Duluth and, in 1925, moved to the main office in Chicago, where he served successively as engineer in the inspection bureau and as engineer of tests. In the latter capacity, Mr. Lindsay went to New York when Universal Atlas moved its main office to that city in 1939. He was promoted to assistant director of tests and research in 1943 and, in the following year, was appointed director of tests and research. Mr. Lindsay was a member of the American Concrete Institute and a director since 1951. He was also a member of the American Society for Testing Materials, and served as a member of Committee C-1. He was former chairman of the working committee on strength; the advisory committee of Committee C-1; and the sponsoring committee on portland cements. He also served on the general technical committee of the Portland Cement Association.



George Lee Lindsay

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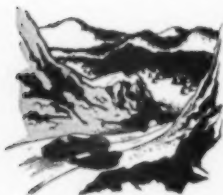
Amalga-Pave, the *cold-mix* process hailed the most revolutionary development in asphalt paving history, makes the fullest use of your present facilities. Now your crusher waste and other low value or surplus materials can become profitable as necessary components. Your sales force, transportation and weighing facilities are already available, so that the total investment usually entails only the cost of the simplified plant itself.

YOU'LL HAVE A COMPETITIVE ADVANTAGE



Tests have shown Amalga-Pave to be unexcelled by any other black top pavement. Yet, with its many sales advantages, it **COSTS LESS TO MAKE**. The Amalga-Pave plant costs less than one-half as much as a "hot-mix" plant of similar size mixing box. Because no heat is used, production and maintenance costs are less, labor costs are cut to one-third, and your *resulting price advantage turns into profitable business*.

A VAST NEW MARKET IS WAITING



The sales potential of Amalga-Pave far exceeds that of "hot mix" asphalt paving. Amalga-Pave eliminates many transportation and timing problems because it can be shipped any distance, ready to lay, or *stockpiled indefinitely*. It finds a ready market not only locally but in outlying areas where high quality, low cost paving has been unavailable. Amalga-Pave's long-awaited answer to many "black top" paving problems can be your answer to increased profits.

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industry news

Freight Car Suggestions

THE CAR SERVICE DIVISION of the Association of American Railroads has appealed to sand and gravel and industrial sand producers to observe the following suggestions in the use of freight-carrying equipment to avoid possible shortages during peak construction periods.

1. Gondolas and hoppers used for sand, gravel, stone and slag should be loaded more nearly to capacity. An average increase of 2 to 3 tons per car would result in a substantial saving of cars, considering the volume loaded nationally.

2. A large percentage of the gondolas are unloaded by clamshells and in many instances equipment is damaged, requiring repair at the shop tracks. The loss of three or four days by cars going to shop tracks and the expense of repairs, if minimized, will result in worth-while gains in car supply to shippers-consignees.

3. Shippers and consignees should consider substituting hoppers in certain districts where they are in greater supply than gondolas.

4. Prompt loading and unloading, particularly over weekends, would also be a definite contribution in aiding adequate car supply.

Agricultural Conservation Appropriations

THE HOUSE OF REPRESENTATIVES, after two days of vigorous debate, finally passed the Department of Agriculture bill on May 1, and authorized \$250,000,000 for the 1953 program. This bill also actually appropriated \$250,000,000 for the 1952 program. There was no controversy on the 1952 appropriations, however. By authorizing the \$250,000,000 for 1953, the House defeated the all-out drive of the American Farm Bureau Federation to reduce the A.C.P. appropriations to \$100,000,000.

Perlite Aggregate Plant

MIDWEST PERLITE PRODUCTS, INC., has begun production of Coralux perlite at its new plant at West Des Moines, Iowa. The plant will process crude perlite ore from the F. E. Schundler and Co.'s Coralux deposits at No Auga, N.M. Finished products will be plaster aggregate, plaster finish-coat aggregate, concrete aggregate and acoustical plaster.

The new plant is of concrete block construction, 40 x 80 ft. The roof is of Stran-Steel construction and the floor is 50 percent at ground level

and 50 percent at dock height. The perlite expanding equipment consists of a gas-fired rotary horizontal furnace with primary and secondary heating tubes.

Sales of the products will be made exclusively through jobbers to dealers, who will in turn furnish the contractors with their materials. William W. Wolf, Jr., is general manager of the new plant and Paul F. Benton is production superintendent.

Research Laboratory

ASBESTOS-CEMENT PRODUCTS ASSOCIATION has announced the establishment of its own research facilities. A small, independent laboratory, whose primary function will be to develop fundamental data and procedures for submission to separate laboratories of member companies for more detailed studies, has been set up at Plainfield, N.J. Ralph L. Barbehenn is technical director for the association.

Alaskan Pumice Deposits

THE GEOLOGICAL SURVEY has prepared a report on pumice deposits in the Alaska Peninsula-Cook Inlet region. R. M. Moxham, author of the report, states that three principal areas of deposition have been found in the region: Katmai National Monument, Augustine Island and the Veniaminof-Aniakchak area.

Occurrence of pumice in the Peninsula-Cook Inlet region has been known for many years, but scientific information pertaining to particular deposits is incomplete, due to only fairly recent demand for the material as a lightweight aggregate.

The report, which also describes deposits of volcanic ash on Kodiak Island and near Mt. Spur, has been placed on file in Geological Survey offices in Washington, D.C.; San Francisco, Calif.; Juneau and Fairbanks, Alaska; and at the Bureau of Mines office, Anchorage, Alaska, where it will be available for use by the public. A limited number of mimeographed copies have been prepared and may be obtained free on application to the Director, Geological Survey, Washington 25, D.C.

Building Cement Plant

PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., was recently given D.P.A. approval for a \$3,000,000 cement plant construction at Grants Pass, Ore. The project has been approved for a fast tax write-off.

Lime Shipments

THE BUREAU OF MINES reported that 7,478,000 tons of burned lime products, an all-time record, were shipped during 1950, which was an 18 percent increase over 1949 shipments, and a 3 percent increase over 1948, the previous record year. The greatest increases reported were for chemical and refractory limes. Building lime showed an 18 percent increase. Agricultural lime remained about the same. The average value per ton of both quick- and hydrated limes also remained about the same. In 1950, quicklime averaged \$10.57 per ton, as against \$10.48 in 1949; hydrated lime amounted to \$12.80 per ton in 1950, compared with \$12.31 in 1949.

Potash Deliveries

THE AMERICAN POTASH INSTITUTE announced that deliveries of potash in the first quarter of 1952, by the five major American producers, totaled 664,751 tons, containing 380,842 tons of K₂O. This was an increase of 6 percent over the same quarter of 1951.

Fights City Regulations

SAMUEL BRAEN'S SONS, which has operated a quarry on a 66-acre tract in North Haledon, N.J., for 25 years, has filed suit to set aside a new city ordinance regulating quarries and setting a \$10,000 annual license fee. The new ordinance regulates hours of quarry operation and sets various other requirements in addition to the annual license fee.

Cover Picture

BUILDEX, INC., has built a new expanded shale aggregate plant at Ottawa, Kan. The plant is designed for

straight-line material flow. The raw material processing section of the plant is built as one unit; the rest of the plant is constructed on a two-unit system. Each unit of the system is designed to produce 300 cu. yd. of finished material per day. The cover picture shows the 125-ft. kilns and a portion of the firing room. Details of the plant are found on page 101.



UNIVERSITY OF MICHIGAN LIBRARIES

Lime Hauling Exempted

THE TRANSPORTATION DIVISION of the O.P.S. in Washington, on April 16, issued a ruling which decontrols the hauling and spreading of agricultural liming materials. This, however, does not change Regulation No. 77 which governs the ceiling price of agricultural limestone. The selling price cannot be raised above the ceiling price established under the regulation without first obtaining permission from O.P.S.

Kaiser Acquires Perlite Operation

KAISER GYPSUM, division of Henry J. Kaiser Co., Oakland, Calif., has announced the acquisition of the Dant, Ore., properties of the Dantore division of Dant & Russell, Inc., Portland, Ore., to augment the company's current line of construction products.

The Dantore quarry and plant, situated on the banks of the Deschutes river, 13 miles east of Maupin, Ore., produces mineral acoustical tile, lightweight plaster aggregate and trowel coat fines.

Acquisition of these properties gives Kaiser Gypsum what is said to be the only plant in the country using perlite aggregate as a base for mineral acoustical tile, and one of the first to introduce perlite materials in the construction field. An expansion program is now underway to increase plant capacity to serve the construction industry more fully and to increase distribution of these products in national markets.

The quarry has a high-grade perlite ore supply, said to be sufficient for 50 years of continuous operation at present plant capacity.

The plant, constructed in 1947, includes the main aggregate and tile building, rod mill, conveyor, wet ore storage and auxiliary buildings, warehouse, dryer, electric substation and company dwellings for plant personnel.

Charles Purvine and William Goodrich, formerly with Dant & Russell Sales Corp., will be the company's tile and aggregate representatives for the Northwest, with home offices in Seattle and Portland, under the supervision of Walter Lord, Kaiser Gypsum's Northwest district sales manager.

Portland Cement Tests

"CHANGES IN CHARACTERISTICS of Portland Cement as Exhibited by Laboratory Tests over the Period 1904 to 1950" was the subject of a paper presented by H. F. Gonnerman and William Lerch, at the 1951 annual meeting of the American Society for Testing Materials.

The first part of the paper describes the changes in composition,

fineness and strength-producing characteristics of Type I portland cement as exhibited by laboratory tests made from 1904 to 1950.

The second section includes composition, fineness, strength-producing characteristics, volume change, heat of hydration and sulfate resistance of the five types of portland cement covered by A.S.T.M. Specification C150.

The paper has been printed in booklet form as A.S.T.M. Special Technical Publication No. 127 and contains 56 pages with numerous tables and graphs included. Copies may be obtained from American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penn., for \$1 each.

D.P.A. Certificate

OREGON PORTLAND CEMENT CO., Portland, Ore., has received a D.P.A. certificate entitling it to a 60 percent tax write-off in five years on a \$5,244,910 expansion program. The company, however, does not plan to start construction immediately. Under the terms of the certificate, 18 months are allowed in which to take advantage of the permit.

Illinois Fluorspar

ILLINOIS STATE GEOLOGICAL SURVEY has announced the publication of Bulletin No. 76, a 147-page book on geology of the fluorspar deposits of the state. Topics discussed include the general geology of the Illinois fluorspar district; history, production and uses of fluorspar; mining, milling and prospecting methods. Price of the book is \$1 per copy, payable in stamps. Public libraries, residents of and/or taxpayers in Illinois may obtain single copies free of charge (\$1.25 postage) until August 1, 1952. Orders should be sent to Illinois State Geological Survey, Urbana, Ill.

Coming Conventions

June 13-15, 1952—

Concrete Products Association of Washington, 23rd Annual Summer Meeting, Harrison Hot Springs, B.C., Canada

June 23-27, 1952—

American Society for Testing Materials, 50th Anniversary Meeting, Hotels Statler and New Yorker, New York, N.Y.

September 3-6, 1952—

American Institute of Mining and Metallurgical Engineers, Industrial Minerals Division, Fall Regional Meeting, Chicago, Ill.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 18,095,000 bbl. of finished cement in March, 1952, as reported to the Bureau of Mines. This was a decrease of 3 percent compared with the output in March, 1951. Mill shipments totaled 15,993,000 bbl., a decrease of 10 percent over the March, 1951, figure, while stocks were 14 percent above the total for the same month in 1951. Clinker production during March, 1952, amounted to 19,959,000 bbl., an increase of 1 percent compared with the corresponding month of the previous year. The output of finished cement during March, 1952, came from 151 plants located in 36 states and in Puerto Rico. During the same month of 1951, 18,708,000 bbl. were produced in 150 plants.

Distribution Plant

PERMANENTE CEMENT CO., Oakland, Calif., recently announced the opening of a 7000-bbl. bulk distribution plant on Kodiak Island, Alaska. This will be the company's third distribution plant in Alaska, augmenting a 30,000-bbl. distribution plant at Anchorage and a 2000-bbl. plant at Fairbanks. Bulk cement will be delivered by barge to the Kodiak plant from Permanente's Seattle, Wash., plant.

Asbestos-Cement Pipe

NATIONAL BUREAU OF STANDARDS has announced the publication of a booklet on "Effect of Exposure to Soils on the Properties of Asbestos-Cement Pipe," by Irving A. Denison and Melvin Romanoff. The booklet summarizes results of studies made on two varieties of asbestos-cement pipe involving exposure for periods up to 11 years, to 15 different soils, ranging from well aerated types deficient in water-soluble salts, to very poorly aerated types containing high concentrates of soluble material. Effects of exposure to soils on mechanical and physical properties of asbestos-cement pipe are indicated by measurements of hydrostatic bursting pressure, crushing strength, water absorption, apparent specific gravity and observations of the condition of the surface of specimens removed.

The booklet may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., for \$.15 each.

Moves Offices

GRAVEL PRODUCTS CORP., Buffalo, N.Y., has announced the removal of its offices from 374 Delaware St. to 1 Austin St. The company recently completed construction of a two-story office and a garage for housing 24 mixing trucks. Cost of the new construction was estimated at more than \$100,000.

Foreign Cement Production

UNION OF SOUTH AFRICA: The cement situation in Natal province has become so acute that an appeal has been made to the Minister of Economic Affairs to reintroduce the system of import permits for overseas cement in an effort to overcome the prevailing shortage. Resumption of cement imports on a national basis to be subsidized by a levy on all cement in the Union is being urged.

Building has been resumed on the new cement plant at Port Shepstone, after a delay of three years, due to the cement shortage. When completed, the plant will have an annual capacity of 200,000 tons of cement. Large deposits of limestone, as well as ample supplies of dolomitic limestone, are said to have been found in the area.

CANADA: Cement production in Canada, for the year 1950, amounted to 16,698,487 bbl., which was an increase of nearly 1,000,000 bbl. over the preceding year. Imports of cement decreased from 2,284,000 bbl. to 1,386,216 bbl., while exports increased from 19,212 bbl. to 23,910 bbl.

DOMINICAN REPUBLIC: As a result of recent expansion, the local cement plant is now able to supply most of the country's requirements for standard-type portland cement.

IRAQ: The Iraq Cement Co., Ltd., Baghdad, produced 63,000 metric tons of cement during 1950. An additional kiln of 350-ton daily capacity has been ordered by the company, but it is not expected to be in operation before January, 1953.

NORWAY: Production of cement, which totaled approximately 680,000 tons in 1951, is to be increased to 800,000 tons by 1955. Cement was placed back on ration in early 1950.

COLOMBIA: Cement production in 1950 totaled 4,272,000 bbl., an amount which met all domestic requirements and allowed an export of 72,000 bbl. Because of Barranquilla's advantageous location on the Caribbean coast, which eliminates costly inland freight, most of the cement exported was produced in that city. Venezuela was the principal buyer, with some shipments made to other nearby countries and to the United States and Canada.

GERMANY: Cement production in the Federal Republic totaled 2,343,000 metric tons during the first quarter of 1951 and 3,268,000 tons during the second quarter. The industry reported that the demand increased steadily the first five months of 1951, but dropped sharply in June, and that developments in the industry were unsatisfactory in general. The capacity of most of the plants could not be utilized fully because of lack of coal, an increase in costs, difficulties in obtaining paper bags and a declining domestic market, resulting in surplus stocks in some districts. The declining market was attributed to a slowing down of operations in the building



Rock crusher in service of Army battalion constructing a supply road in Korea

Crushing Plant With a War Record

A CEDARRAPIDS CRUSHING PLANT, donated to the Army on December 22, 1943, by Iowa Manufacturing Co. and employees, was rebuilt in 1950 and is once more in the service of the Army, processing gravel for the construction of a vital supply road to the summit of the famous hill, Little Gibraltar in Korea.

The 34-ton crushing plant was originally built as a tribute to the first employee of Iowa Manufacturing

Co. who lost his life in World War II. It was built of parts donated by the company, with 8000 man-hours of work donated by employees in its assembly. Named "The Spirit of Cedar Rapids," the plant saw service in the China-Burma-India theater in World War II and was also used at Lingayen Gulf in the invasion of the Philippines. When the plant arrived back at Cedar Rapids in October, 1950, for overhaul and reconditioning, many of the same employees who helped build the machine seven years before, again donated their services for rebuilding it for service in Korea.

industry, due to lack of funds. Further declines are predicted. In the first half of 1951, Western Germany imported 2228 tons of cement, valued at \$62,000, but exported 818,054 tons, valued at \$10,970,000.

These reports were taken from *Mineral Trade Notes*, published by the Bureau of Mines.

Asbestos Pipe Plant

KEASBEY & MATTISON Co., Ambler, Penn., has begun construction of an asbestos concrete pipe plant at Santa Clara, Calif. The plant, which will cost approximately \$2,750,000, will represent the first unit of a large scale development planned on the company's 26-acre site. Total investment in the operation is expected to run to \$5,500,000 during the next decade.

Operation of the first unit is expected to begin by April, 1953. Most of the plant's production will be used for city water and sewage systems. Other large consumers will be western oil companies which will use the pipe for carrying off brine water from oil wells.

Additional units to be built later

will include facilities for the production of asbestos flues, roofing and other asbestos building materials.

Purchases Sand and Gravel Company

SCHWARTZ SAND & GRAVEL Co., Cleveland, Ohio, has been purchased by G. G. Garland, H. L. Bliss and Stanley Dupont from K. V. Schwartz. The company will continue to operate under the same name. Mr. Garland, president of the new company, was formerly vice-president; Mr. Bliss was named vice-president and Mr. Dupont, marine superintendent.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of April and for the first four months of 1952 are listed by the Portland Cement Association as follows:

	Sq. yd. awarded	
	during April 1952	during first four months 1952
Roads	2,900,827	8,674,759
Streets and alleys	2,247,654	7,168,368
Airports	237,682	2,164,212
Total	5,386,063	18,007,339

HINTS and HELPS

FROM BUILDING IDEAS DEVELOPED BY OPERATING MEN

Conveyor Design

THE 7-MILE BELT CONVEYOR SYSTEM used in the construction of Bull Shoals dam in northern Arkansas carried successfully more than 5,000,000 tons of minus 6-in. crushed stone. Even



Wood-constructed tower supports counterweight for horizontally-mounted take-up pulley assembly

though it has now been dismantled, it is worthy of some detail mention. The supporting frame for the 21 flights making up the assembly was of wood construction with a walkway on one side only. The legs of the A-frames were for the most part 3 x 4's, having a concrete mud plate, with the legs strapped to the mud sills. The legs were on 10-ft. centers and the 2- x 6-in. runners supporting the carrier and return rolls were bolted to the A-frames. On some of the shorter supporting members, nailed construction was used throughout.

At the unloading end of each flight was a horizontally-mounted take-up pulley that functioned through a counterweight. The "travel" of the take-up pulley was about 30 ft., allowing ample length for belt stretch (when starting) and other factors. The rails supporting the take-up pulley were mounted under the head assembly.

The tower supporting the counterweight was also of wood construction and consisted of two A-frames, about 30 ft. high, with a concrete counterweight. The three illustrations show the details of the construction.

At the transfer points the stone dropped from a belt to a baffle plate which was placed so that the stone slightly reversed its direction of travel and then dropped almost vertically onto the offbearing belt. This practice is somewhat contrary to generally accepted theories which hold that the material should travel in the direction of the offbearing belts. The openings at the transfer points were amply large so that there was rarely any piling up of the stone due to clogging.

Calculating Heat Loss

By W. F. Schaphorst

A SIMPLIFIED METHOD for determining heat loss when oil is used for fuel is as follows:

(A) Multiply the percent CO₂ in the stack gas by 5; to the product, add 700; multiply the sum by 0.08.

(B) Subtract the temperature in deg. F. of the air entering the furnace from the stack gas temperature and multiply the difference by the percent of carbon in the fuel.

(C) Multiply the percent CO₂ in the stack gas by the B.t.u. value of the fuel per lb.

(D) Multiply (A) by (B) and divide the product by (C). The quotient is the percentage of fuel loss.

Thus, for example, if the heat value of the fuel oil used under given boilers is 18,000 B.t.u. per lb.; 88 percent of the oil is carbon; the flue gas contains 7 percent CO₂; the stack gas temperature is 600 deg. F.—what is the heat loss up the stack due to low CO₂, and the temperature rise of (600-75) 525 deg. F.? Substituting in the above rules, we have:

$$(A) 7 \times 5 = 35; 35 + 700 = 735; 735 \times 0.08 = 58.8$$

$$(B) 600 - 75 = 525; 525 \times 88 = 46,200$$

$$(C) 7 \times 18,000 = 126,000$$

$$(D) 58.8 \times 46,200 = 2,702,700; 2,702,700 \div 126,000 = 21.4$$

The fuel loss therefore is 21.4 percent.

Now let us assume that conditions have been improved to the extent that the CO₂ becomes 12 percent and the stack gas temperature is reduced to 500 deg. F. The temperature of the air entering the furnace is still 75 deg. F., hence the difference is 425 deg. instead of the former 525 deg.

Making use of the above rules in the same way, it will be found that the fuel loss is now 10.5 percent instead of the former 21.4 percent. The question now may arise: How much fuel is saved by improving the CO₂ and the stack gas temperature? The answer is not 21.4 percent minus 10.5 percent, or 10.9 percent, as is often mistakenly given as the answer.

To make the point clear, let us say that you burned 100 lb. of fuel. In the first problem, you lost 21.4 percent, or 21.4 lb. of fuel. It is that 21.4 lb. of fuel you want to save and not the entire 100 lb.; therefore, 21.4 lb. is



Left: Main bents consist of part bolted and part nailed construction. Right: Take-up pulley is mounted horizontally

HINTS AND HELPS

the basis of this problem. Then, in the second problem, you lose only 10.5 percent of the fuel, or 10.5 lb. You therefore save (21.4 lb. minus 10.5 lb.) 10.9 lb. of fuel. To determine the percentage saved, you divide the 10.9 by 21.4, which gives a fuel saving of 51 percent. In the form of a formula it would be:

$$\frac{L_b - L_a}{L_b} = S$$

where,

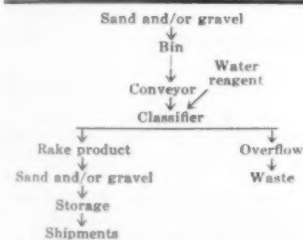
L_b = percent loss of fuel before improving conditions;

L_a = percent loss of fuel after improving conditions;

S = fuel saved as a result of improving conditions.

Sand and Gravel Treatment

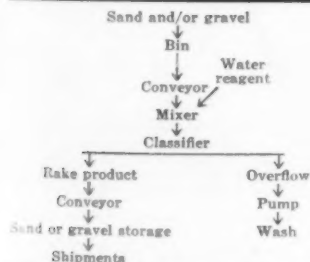
IN THE MARCH, 1952, issue of ROCK PRODUCTS (page 64) a method of treating sand and gravel for the removal of clay was described by Donald S. Phelps. In this method, the sand or gravel is fed into a pool or a classifier where water and a dispersing agent are then added. The gravel is kept in motion to release the clay and allow it to be discharged over the weir with the water. The coarse material is delivered by the



Prospective flowsheet No. 1

classifier rakes as a deslimed product. The sand or gravel must be fed to the circuit at a fairly constant rate and the addition of water must be made before the material gets to the classifier.

The author has now submitted the accompanying diagrams of two proposed



Prospective flowsheet No. 2

posed flowsheets representing two possible methods of treating sand and gravel. The methods are optional,

depending on the amount of clay it is necessary to remove.

Hard Facing Machinery Parts

EVEN WITH all the durable and rugged qualities built into modern rock crushing and other rock products machinery, severe usage will eventually take its toll unless steps are taken to keep the machinery constantly in top operating condition.

A northwestern sand and gravel company, which uses hard-facing al-



Feed screws of a double-spout bagging machine, at a perlite expanding plant, are hard faced every 8 to 10 weeks

loys extensively in the maintenance of its machinery, reports that hard facing of machinery parts has reduced maintenance costs and enabled a more steady production schedule. On an average, about 1500 lb. of hard metal are applied to wearing equipment every year in this company's three plants.

For speed and economy, hard metals are applied wherever possible by electric arc; deposit patterns developed vary from a single stringer bead to cross hatching or a solid deposit, depending upon the wear problem in each individual case. Single stringer beads of Stoddy Self-Hardening 21 are used for scoop lips, loader bucket

points, conveyor bucket lips and similar parts. On the bottom of dragline bucket runners and to back up a solid deposit on the points of shovel teeth, a series of stringer beads are said to be the most effective. Solid deposits are used to combat wear on dragline bucket lips, the face of loader screws and crusher jaw corrugation. On screen lips, side guides and power shovel buckets, cross hatching is applied so that the material being handled will compact in the pattern to absorb much of the wear. Coated Stoodite is used to protect equipment parts subjected to more severe abrasive wear on parts which cannot be conveniently inspected and faced, such as sand drag rolls and back toggle seats of jaw crushers. Hard facing was said to give the machine parts three to six times longer life.

A western perlite expanding plant also reports reduced maintenance costs and increased efficiency of production equipment through the use of hard-facing alloys. Both Stoddy Self-Hardening 21 and Borod have been included in the company's preventive-maintenance program. Self-Hardening 21 is used mainly to protect baffles, wear-plates and elbows where wear in the handling system is most severe; hard facing has reduced the possibility of cutouts and costly shut-downs for repairs. Feed screws of a double-spout bagging machine had been a major wear problem; these screws, which cost \$60-70, normally lasted about one week, but with hard facing, they are said to work effectively for over two months. The procedure followed at present is to remove the screws every eight to ten weeks and touch them up with Borod.



Left: Close-up of exhaustor fan blade on a loader used at a sand and gravel operation which has been hard faced. Right: Close-up of loader bucket shows bead of hard-facing alloy

NEW

Machinery



Combination Drill

MOBILE DRILLING, INC., 960 North Pennsylvania St., Indianapolis, Ind., has designed a combination drill rig offering all three types of drilling: rotary, auger and percussion. The machine is designed primarily as an auger-type machine and can be used in prospecting, seismic surveys, etc., through shale, hard pan, sand and gravel, clays and soft sandstone. The



Drill rig mounted on a 1-ton, four-wheel drive truck. Drill is shown in drilling position; hydraulic cylinder collapses into drill carriage for traveling

B-36 drill has a hydraulic feed of approximately 8000 lb. pressure; the feed cylinder is located directly over the rotary turntable.

The carriage of the drill and drill mast are of tubular construction. The drill mast telescopes together with the feed cylinder hydraulically to an operating height of 16 ft., and nests in the tube members of the drill carriage for cross-country travel with a maximum over-all height of 10 ft.

The drill can be furnished with an auxiliary cat head, sand reel and special high pressure water pump. The maximum depth for auger drilling without water is approximately 150 ft.; depth for rotary drilling with water is in excess of 300 ft.

The B-36 can use either 3- or 4-ft. augers from a 3 to 10 in. diameter. It can also handle drill stems in 10-ft. sections. The unit can be mounted on any truck with a power take-off. Hydraulic stabilizers take the drilling pressures off the tires while the drill

is in use. The unit is powered by the power take-off of the vehicle. Variable speed controls at the rear of the truck enable the operator to utilize the full power of the vehicle's engine in drilling.

Multiwall Bag

KRAFT BAG CORP., 630 Fifth Ave., New York 20, N.Y., has developed a special valve insert multiwall shipping sack, which is said to be primarily suited for chemical and fertilizer products. The manufacturer states that the valve insert does away with traditional I. C. sleeves, gives more positive valve closure, minimizes sifting, and permits cleaner handling.



13-cu. yd. scraper unit

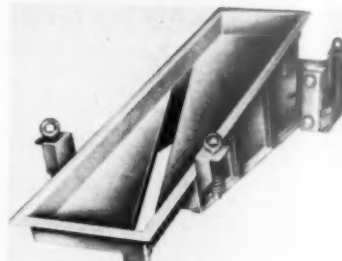
Tractor-Scraper Unit

THE HEIL CO., Road Machinery Div., Milwaukee 1, Wis., has announced that commercial models of the 2C500 Heiliner are now available. The unit is equipped with a 13-cu. yd. scraper. Features include Heil's Hydro-Steer, unobstructed visibility, heavy-duty, two-shoe air brakes synchronized on both the tractor wheels and the trailing unit wheels, and speeds up to 25 m.p.h., even when loaded. A 165-hp. Model HRB600 Cummins diesel engine powers the unit.

Heavy-Duty Dump Truck

THE WHITE MOTOR CO., Sterling Div., Milwaukee 1, Wis., has put into production a heavy-duty, 15-ton capacity, dump truck with the Super-Traction planetary-type drive axle. The planetary-type drive rear axle with the Sterling-White Super-Traction differential divides the power delivered to each rear wheel according to the amount of traction existing between the tire and the road surface.

The chassis is powered by a 250-hp. engine and the transmission is of the ten-speed type. Maneuverability and ease of operation is said to be assured through the use of a hydraulic power-actuated steering gear.



Diagonal discharge spreader feeder

Vibrating Spreader Feeder

SYNTRON CO., 450 Lexington Ave., Homer City, Penn., has announced a new style vibrating diagonal discharge spreader feeder. The feeder is made up with a flat pan trough having a diagonal slot and powered by a single electromagnet drive. The latter may be mounted either above or below the flat pan trough. The rate of feed is controlled by a feed control knob in the separate control box.

Stripping Shovel

KOEHRING CO., Milwaukee 16, Wis., has introduced a high-lift stripping shovel. Using the same base machine as the standard 2½-cu. yd. Model 1005, the high-lift stripper operates with a 50-ft. boom and 36-ft. dipper stick; this allows a maximum dumping height of 40 ft. and a reach of 60 ft. with boom angle at 45 deg.

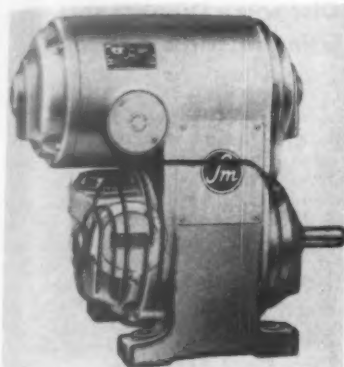
Features of the high-lift design include a single dipper stick with



High-lift stripping shovel

cable crowd and a twin box section boom structure. In addition, the unit can be converted for lift crane, dragline or clamshell operation. It will handle dragline buckets of 2½ to 4 cu. yd. capacity or clamshell buckets of 3 to 4 cu. yd.

NEW MACHINERY



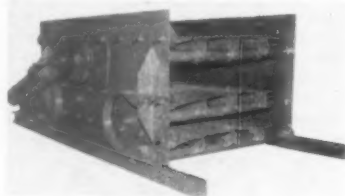
Variable speed drive mounting dimensions interchangeable with standard NEMA motors

Variable Speed Drive

STERLING ELECTRIC MOTORS, INC., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif., has announced a variable speed drive with mounting dimensions that are interchangeable with NEMA standard motors. The drive consists of a variable speed transmission with positively adjusted pulleys and an induction motor built in a single unit. The unit is available in single phase in 1-3 hp., and polyphase in 1-15 hp., with 2:1, 3:1 or 4:1 speed variation, and in dripproof, splashproof and totally enclosed design.

Expands Screen Line

KOLMAN MANUFACTURING CO., 4200 West 12th St., Sioux Falls, S.D., has announced the expansion of its



Multiple-deck screens

vibrating screen line to include a larger variety of single-, double- and triple-deck screens. Now available in the Series C screens are multiple-deck units 3 and 4 ft. wide and ranging to 8 and 10 ft. lengths. Also added is a larger single-deck model, 42 in. wide and either 6½ or 7 ft. long.

Electrode Holder

TWECO PRODUCTS CO., P.O. Box 666, Wichita, Kan., has introduced a lightweight, 300-amp. electrode holder, known as the Model A-732 Tweco-tong holder. It features a lightweight, high copper alloy for maximum conductivity, and the tip end insulators are interchangeable. The holder will handle ½- to ⅞-in. electrodes. The welding cable may be soldered or clamped to the body of the holder.

Power Units

THE OLIVER CORP., 400 West Madison St., Chicago 6, Ill., has added a heavier series of power units, the 199, developing 73 hp., to the company's power unit line. Like the other units in the series, the 199 engines are available for gasoline and diesel fuels.

The six-cylinder engine has a 4-in. bore, 4-in. stroke, and a displacement of 302 cu. in. Maximum continuous duty r.p.m. is 1800, with intermittent duty at 2000 r.p.m., and a governed speed range from 1200 to 2000 r.p.m. with close governor regulation.

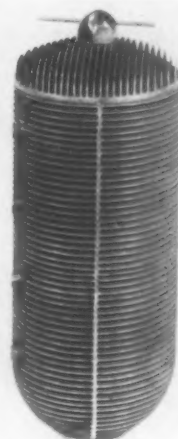
Bin Level Control Switches

STEPHENS-ADAMSON MFG. CO., Aurora, Ill., has added two units to its line of Tellevel automatic bin level control switches, the heavy-duty and



Left: Heavy-duty bin level control switch. Right: Explosion-proof control unit

explosion-proof units. The units are designed so that a rising, or falling, level of material in bins deflects a pendant float actuating a micro switch. The explosion-proof unit is designed for operation where explosive dusts and vapors occur. The heavy-duty control unit, for materials above ¾ in., has a steel housing to protect the switch mechanism and the standard plastic float ball is replaced by a steel cone.



Oil heat exchanger and oil clarifier

Oil Heat Exchanger and Oil Clarifier

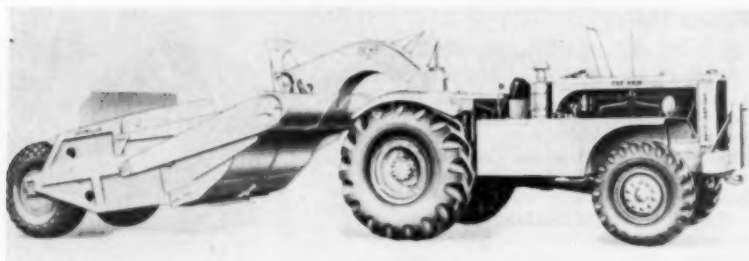
J-B ENGINEERING, INC., LTD., 440 Seaton St., Los Angeles 13, Calif., has developed a combination oil heat exchanger and oil clarifier for use on diesel powered equipment. The aluminum alloy unit, J-B-99, has a 10 in. O.D., is about 30 in. in overall length, and is completely finned. The unit uses a replaceable filter element consisting of a fibrous material, which will filter down to 2-4 microns. The combination unit is equipped with a by-pass valve so that it can be installed in both full-flow and by-pass oil circulatory systems.

Crushing and Screening Plant

PIONEER ENGINEERING WORKS, INC., Minneapolis 13, Minn., has announced a 50-t.p.h. crushing and screening plant, the 33R Triplex, designed primarily for use by the armed services in military construction. All conveyors and auxiliary equipment are mounted on the main plant units. It can be placed in operating position, conveyors positioned, etc., with the use of hand tools and plant mounted winches and hydraulic rams, an important factor in military operations.



Crushing and screening plant for military construction



Scraper attached to rubber-tired tractor

Scrapers

CATERPILLAR TRACTOR CO., Peoria 8, Ill., has announced a pair of new scrapers for use with the DW10 tractor. The No. 10 scraper is somewhat lighter than before, with a capacity of 7 cu. yd. struck, 9 cu. yd. heaped and 11.5 tons maximum carrying capacity. For heavier applications where a pusher is more important, the No. 15 scraper has a capacity of 10 cu. yd. struck, 13 cu. yd. heaped and 17 ton maximum capacity.

The scrapers are similar in basic design. Both have a flat, double-bottom bowl of high tensile steel. A stinger blade with reversible cutting edge is standard equipment. Cable rigging provides for positive loading and ejection. Air brakes are synchronized with the tractor brakes.

Blasting Unit

MINE SAFETY APPLIANCES CO., Braddock, Thomas and Meade Sts., Pittsburgh 8, Penn., has introduced a multiple-shot blasting unit which will fire up to ten shots simultaneously. The unit weighs one lb., measures $2\frac{1}{2} \times 2\frac{1}{4} \times 4\frac{1}{4}$ in., and is carried on the belt by means of a snap-on clip.

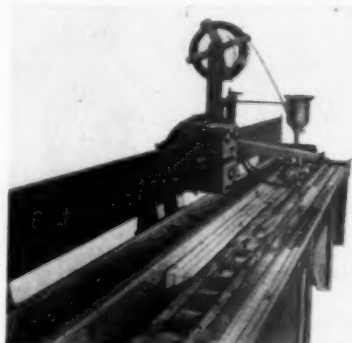
There is no danger of accidental firing, the manufacturer says, as the wiring circuit is completely insulated from the battery container; and since the unit is capacitor-operated, the full charge is dissipated with each shot, eliminating misfires. The top of the battery container and the push

button lead retainers also are insulated.

The firing plug is equipped with brass contact terminals. Lead wires are held firmly in the firing plug by spring-loaded retainers. When lead wires are inserted and the firing plug pressed into the battery container, a neon light glows at the top of the case to indicate a full charge in the capacitor.

Automatic Welder

PENN TOOL & MACHINE CO., Danville, Ill., has introduced an automatic welder and resurfacing unit, called



Automatic welder and resurfacing unit

the Conservall, which welds or resurfaces any part requiring a horizontal pass. With the addition of a power driven, variable speed Berkeley Rotator, the unit will resurface circular work.

Welding length and space between welds are automatically controlled and indexed by cams which are quickly adjusted to handle any type track. The resurfacing operation is done by the submerged arc method.

The standard Conservall is 30 ft. long, being made up of three 10-ft. sections. Each section is complete with work table or trough and rail for supporting the travel carriage and rack. The welding head is supported by machined slides which provide vertical and horizontal adjustments to meet welding or resurfacing requirements without shifting the work piece. A 5-ft. carriage track extension permits moving the welding head over the Rotator when circular work is to be handled.



Multiple-shot blasting unit

Discharge Diaphragm for Grinding Mills

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee 1, Wis., has announced an improved discharge diaphragm for its grinding mills. Features of the diaphragm include curved lifting wings to promote best discharge conditions of material after it passes through the slots in the grate sections, grate sections supported on ends and under each bolt, bodies of bolts protected from wear by bosses, heavily ribbed grate sections and center wearing plate, and a filler bar which makes possible the removal of the grate section without disturbing the adjacent shell liner.

The center wearing plate is flush with the grate section to protect it from rapid wear at the bolt circle. Conversion from one level to another is said to be simple since this arrangement permits the grate section to be removed without first taking off the center wearing plate. On the intermediate or low level types of diaphragm mills, the unperforated section is a separate plate.

The improved discharge diaphragm is being used on new 7-, 8-, 9-, 9½- and 10½-ft. A-C mills. Diaphragms of existing mills can be modified, the company says, to incorporate some of the features of the new diaphragm, such as the filler bar and the ribbed grate section.

Ball Bearings

SKF INDUSTRIES, INC., Philadelphia 32, Penn., has announced the development of sealed ball bearings that are interchangeable with conventional bearings. Known as SKF's Red Seal bearings, the seal is made of Du Pont Fairprene and is said to be unaffected by petroleum-base lubricants, normal operating temperatures, or ageing. The seal extends below the steel retaining ring, forming a flexible lip which lightly touches a smooth, uniform chamfer of the inner ring. Retaining rings have circular-formed ribs for greater rigidity. The bearings are supplied in standard single-row SAE widths and are available with any combination of snap rings and metal shields.

Adds to Pump Line

RICE PUMP & MACHINE CO., Graton, Wis., has announced the addition of three larger sized pumps, the 20M, 30M, and 40M, to its line of self-priming centrifugal pumps. The design of these units includes cartridge-type shaft seals, open-type nonclogging impellers, hardened steel wearing plates, built-in check valves and straight line flow of water through the suction openings to the impeller. The pumps are available mounted on skids, pneumatic-tired wheels or steel wheels.

NEW MACHINERY

Bag Holder

RICHARDSON SCALE Co., Clifton, N.J., has announced a self-locking Cam-Grip bag holder for use in filling



Self-locking bag holder

bags with such bulk materials as cement, perlite, vermiculite, chemicals, etc. The self-locking grip is designed to suspend 50-, 80- and 100-lb. multi-wall paper bags while being filled. It comprises a bag-holding mechanism mounted on a spout which the user bolts or welds to the hopper or bin outlet. When releasing a filled bag, a semi-circular release bar is pushed up, releasing the cams and allowing the bag to drop to a conveyor or skid.

Heavy-Duty Lubricant

D-A LUBRICANT Co., Inc., 1331 West 29th St., Indianapolis, Ind., has announced the development of a heavy-duty, lithium-base lubricant, D-A Lithium. It is claimed that the grease combines the advantage of positive water resistance with a high melting point, and will not harden in bearings or separate in storage.

Interchangeable Hub Sprocket

FORT WORTH STEEL AND MACHINERY Co., Fort Worth, Texas, has developed an interchangeable sprocket to fit its "QD" V-belt sheave hub. The sprocket is taper bored to receive the tapered hub. Bolts are provided to pull the sprocket onto the tapered split hub for a tapered drive assembly and a positive press fit on the shaft. Tapped holes in the sprocket permit the use of pull-up bolts as jack screws to break the tapered fit when dismounting the sprocket. These sprockets are available in $\frac{1}{2}$ through $1\frac{1}{4}$ in. pitch.

Storage Battery

CHICAGO FORGING & MFG. Co., 1317 W. North Ave., Chicago 22, Ill., has been licensed to manufacture the Varley battery, a British-designed product, which is claimed to minimize corrosion and vibration damage and eliminate plate shedding and buckling.

The sludge chamber commonly provided to hold shed material and unabsorbed acid has been eliminated. The plates extend the full length of the case. Conventional wood or fiber glass separators have been replaced with Varlenite, a patented material adapted from diatomaceous silica. Made in sheets and placed between the plates, the cushion holds the plates together, which is said to minimize plate shedding and buckling.

One-Unit Bogie Wheel

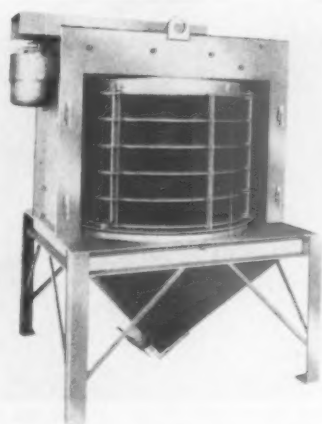
STERLING STEEL CASTING Co., East St. Louis, Ill., has announced production of a one-unit bogie wheel (roller) for crawler-type tractors. The roller comes completely assembled, including bearing adjustment and lubrication. A positive seal keeps out foreign material. An exclusive Sterling locking device is said to assure bearing adjustment and alignment at all times.

Centrifugal Screen

NORDBERG MANUFACTURING Co., Milwaukee 1, Wis., has developed a high capacity unit for sharp separation of wet or dry materials, the Symons V screen, which combines a centrifugal action with a gyratory movement.

The cylindrical screen, mounted vertically, is 3 ft. high, 12 ft. in circumference, and is completely enclosed. The actuating mechanism is mounted on roller bearings and the vertical frame is constructed of standard steel shapes and plates. A cupped feed plate with radial vanes sets a little below the upper edge of the drum.

Material to be screened enters through an opening in the top of the frame and is impinged by the feed plate against the inner surface of the drum. The oversize particles are held against the screen for a brief interval with the fines passing through. Using 14 gyrations to one drum rotation, each gyration of the drum produces an inward deflection of the material being screened. This frees the holes in the screening sur-



Cylindrical screen combines centrifugal action with gyratory motion in separation of material

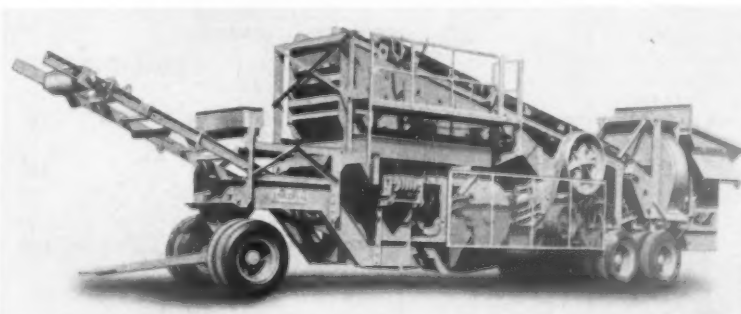
face for the passage of undersize at the next contact and permits the material to drop a short distance. This process is repeated until the particle either goes through the cloth or is discharged as oversize.

When used for wet screening, water sprays are mounted in the lower assembly with sprays impinging upward and outward. In dry screening the natural fanning action carries the "air float" fines through with the undersize. The screen is built with various types of discharge bases, either wet or dry depending upon installation requirements.

Portable Plant

UNIVERSAL ENGINEERING CORP., division of Pettibone Mulliken Corp., Cedar Rapids, Iowa, has added the 880 Senior "R" to its Gravelmaster series of portable crushing, screening and loading plants.

The plant features a 10- x 36-in. roller bearing jaw crusher, 30-in. dia. x 22-in. face star gear roller bearing roll crusher, and a 4- x 10-ft. 2½-deck inclined gyrating screen. The plant is driven by a single 115- to 125-hp. power unit mounted on the plant, or by a separate side drive through a universal joint connection from separate truck mounted power.



Portable crushing and screening plant

Tailings



Left: General view of dam and pipeline extending across the top of it. Right: This section of pipeline extends to the back areas of the pond, the main pond is at the right. The line is supported across the wing of the lake by tailings

Producing Agstone by Wet Process

St. Joseph Lead Co. processes dolomitic limestone containing galena to recover lead and agstone. Tailing control dam built of waste material

ST. JOSEPH LEAD CO., the nation's leading producer of lead, has large holdings and operations in southeastern Missouri. It is also a large shipper of agstone, but of primary interest here is the method the company developed for what might be called a "riskless" method of impounding tailings or mill rejects. The method is one that also lends itself ideally to the rock products industries, for as a rule these have large but variable amounts of strippings to dispose of. The plan was adopted at the Federal mill of the company. As agstone recovery is also a preliminary step in the tailing control, this information

By **WALTER B. LENHART**

should be of interest to agricultural limestone producers who wash their stone and thereby have a wet material to recover. The tailing control scheme is also a cheap one as an attendant is not required except for short "dam raising periods," or periodic inspections by the supervisory members.

From the underground workings there is a considerable amount of waste rock that must be hoisted to the surface for disposal, this material ranging from fines to minus 28-in.

rock. This rock forms the backbone of the dam.

The operators of this tailing system consider that the dam was built practically without cost as the materials in it would have had to be disposed of anyway and that the cost of water reclaiming for milling is offset by the lower power requirements because of decreased pumping heads. Furthermore, water from this pond can be pumped to the large storage lake (at a higher elevation) during periods of low power demands.

The mill has a capacity of 15,000 t.p.d. The ore, a dolomitic limestone containing galena as the lead mineral, is processed by a combination of tabling for the coarser sizes and flotation for the finer. Therefore, the tailings are a composite of these two processing techniques and have the following screen analysis:

Mesh	Cumulative percentage by weight	Percent weight
20	4.0	4.0
28	10.8	8.8
35	23.5	12.7
48	36.4	12.9
65	47.2	10.8
100	57.4	10.2
150	65.1	7.7
200	71.0	5.9
Minus 200	100.0	29.0

The pulp containing 50 percent solids goes to the tailing ponds at the rate of 3300 g.p.m. through a 12-in. dia. steel pipeline. The line is 4800 ft. long and the maximum static head is 78 ft. The joints are welded and there are no sharp bends. The expected life of the pipe is 7 to 8 years. The pulp is pumped through

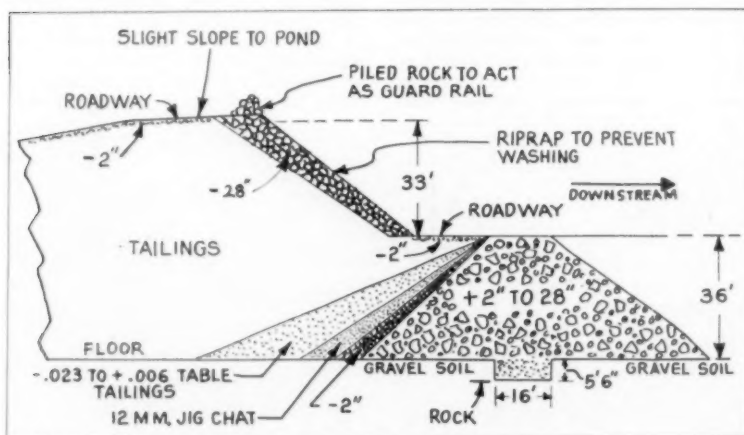


Fig. 1: Cross section of Davis Creek dam used in tailings control

TAILINGS

the line by centrifugal pumps with three pumps in series and with three sets available, or a total of nine pumps, not all of which are used at the same time. The pumps are all at the mill end. In one battery there is a 10-in., 10-in. and an 8-in. pump. This battery does most of the work. The other pumps are 8 in., 10 in. and 10 in., and a 10-in., 8-in., 8-in. group. Both Morris and Pettibone Mullikin pumps are used.

Construction of Dam

Near the mill, which is located at Flat River, Mo., about 8 miles south of Bonne Terre, is a small stream locally referred to as Davis creek.



Clear water is drawn off over weirs at this intake tower. As the tailing dam grows in height, the concrete section will be raised so the reinforcing rods are left projecting above the present structure.

Damming of this stream was first considered and the various plans submitted ranged from a concrete barrier to a dam made from the tailings alone. These ideas were all abandoned because of danger from flash floods. The watershed drained by Davis creek covered about 3600 acres, mostly hill land with steep valleys. The maximum rainfall observed was 3.36 in. in one hour. That section under and near the damsite is a dolomitic limestone covered with sand and gravel, with most of the pond's basin being a shale. Downstream are important bridges, business establishments and some residences. The drainage is pear-shaped and about $2\frac{1}{2}$ x 3 miles along its greatest dimensions.

To start the construction of the dam a slot was cut in the gravel soil, measuring 270 ft. long, 16 ft. wide and $5\frac{1}{2}$ ft. deep, following the approximate center line of the proposed dam. This excavation was to bedrock, but it exposed some gravel-filled channels. The slot was filled with minus 200-mesh material from the older tailing pond then in operation. All sod and brush was removed from the rest of the underdam structure.

Next, plus 2-in. waste rock was prepared from a grizzly and the larger sizes were used to make a level fill about 12 ft. wide at the top and 550 ft. long. The maximum height was 36 ft. and required about 25,000 cu. yd. of waste rock. The idea of the screen-

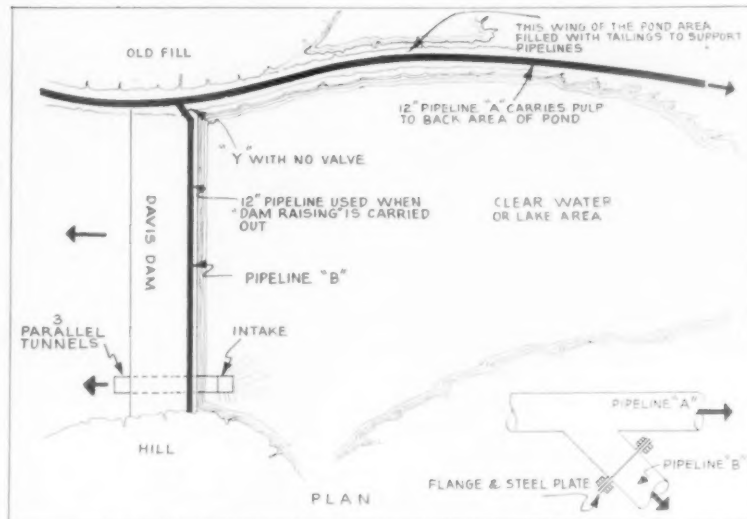


Fig. 2: General layout of dam and tailings pipelines. When pipeline "B" is used the steel plate over the Y-connection is removed so that tailings will flow out over the top of the dam to be used in building it higher. The sketch in the lower right shows the Y-connection.

ed stone was that a high percentage of voids would permit a relatively rapid escape of some of the flood waters and that the static head as well as the velocity through the mass would drop fast enough to reduce the chances of washing at the toe of the structure. This plan has worked just as designed.

Before sealing the dam a water recovery tunnel was built of reinforced concrete. The tunnel was built in a slot about 800 ft. long dug through the west end of the dam. Provisions were made at the upper or inlet end for an inlet tower, also of concrete. This concrete tunnel is rectangular in shape and divided into three parallel drainage sections, one of which is connected to a set of pumps for water recovery purposes. The other two drain clear water into the area below the dam.

By referring to Fig. 1, it becomes more easily understandable how the dam was built. After the plus 2-in. minus 28-in. fill was built as previously described, minus 2-in. material

was dumped over the upstream face of the dam until all the coarse rock was buried. This finer material was then covered with older mill rejects called "chats" which were approximately plus 20 mesh minus $\frac{1}{2}$ in. (12 mm. jig tailings). This type of construction with the large void areas downstream prevented any large static heads from developing due to leakage through the face of the dam. The next step was to pump table tailings that were minus 20 mesh but containing a minimum of the finer sizes. After the bed of table tails, regular mill tails were pumped and placed over the upstream face.

Tailings Disposal

In marked contrast to most of the tailing disposal systems that ROCK PRODUCTS has previously described, current tailings are not pumped continuously to the damsite. This is done only when "dam raising" is desired. Otherwise the tailings are pumped to the back areas of the 91½-acre settling pond where they are simply dumped. Thus no special attention need be given to the disposal system for ample free-board is available at the dam itself to take care of level fluctuations. It is estimated that this tailing pond will store approximately the equivalent of 60,000,000 tons of dry solids. When it is desired to raise the dam, additional waste rock is trucked in for the downstream section and the area is built up 5 to 10 ft. A shorter leg of the main pipeline is connected to the main line by a Y, no valve being used. This short leg extends across the dam. Holes $\frac{1}{2}$ in. in diameter are burned in the bottom of this pipe on 8-ft. centers. At each hole there is a strap or band of soft steel around the pipe, to which is riveted some old pieces of conveyor

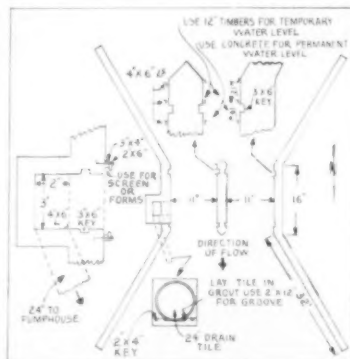
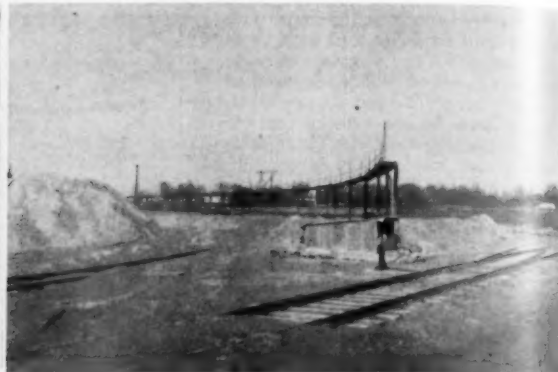


Fig. 3: General details of overflow structure



Left: One of the five pits for agstone, with elevated pipeline. This pile is completed and is draining and air drying before shipment. Right: This agstone pile is just being started. Note the elevated pipeline and walkway and the railroad spurs between the piles.

belting. The bands are held in place loosely by $\frac{1}{2}$ - x 6-in. bolts, but when it is desired to stop the flow of pulp through that orifice, two oak wedges pull the band up securely against the opening. Wood chips do not cause any stoppage of these holes as they are removed in the mill thickeners. This pipe is filled with water before tailings are sent through it.

The pipeline is kept close to the ground and is supported by steel tripods made from worn-out diamond drill rods. A mud board is used under the leg of each tripod; these are not salvaged. When the tripods have become buried so deep as to be of little

use, they are recovered by a tractor for reuse. The drill rods are 10 ft. long and about 2 in. O.D. Used 2-in. pipe is also used for the tripods. The tripods are on about 40-ft. centers. When it is desired to raise a section of the pipeline, the tailing disposal crew raises sections progressively with a $1\frac{1}{2}$ -ton chain block. In this manner, none of the pipeline supporting structure is lost by becoming buried in the tailings except the 2- x 6-in. toe boards. Filling is first done between tripods.

The concrete drainage tunnel at its upstream end controls the level of the liquid in the pond and, similar

to some previously described, it is designed to be built progressively higher and higher as the height of the dam itself increases. Timbers are used as the weir gate for temporary water level control but as the level of the water gradually rises, concrete replaces the timbers for permanent control. The general plan of this assembly is shown in the drawing (Fig. 3). The water reclaimed from this pond is pumped to an older pond from which it is reused. This pond is at a higher elevation and near the east end of the Davis creek dam.

The pulp at the Federal mill appears to be a relatively fast settling material, but even so it is

possible that during pond dam-building operations an unclear effluent could result, as the intake end of the water reclaiming system is quite close to the upstream face of the dam; however, during that time the weir could be sealed off entirely until dam-raising was completed.

Sub-freezing weather in the area has not impeded tailing pond operations and milling is on a 5-day, 24-hr. basis with a shutdown on Saturdays and Sundays. If a shutdown occurs during cold weather the lines are drained.

The surfacing of the exposed sections of the dam with 2-in. waste rock, especially those parts that could dry out, is done to prevent wind erosion of the structure and its accompanying nuisance to the neighborhood. That portion of the pond near the waterline at the time of inspection was solid and one could walk almost to the water's edge.

Agstone Processing

As previously mentioned, agstone is an important product of this operation. The mill tailings, after the extraction of lead, are not all waste, for in addition to the major components of calcium and magnesium carbonates, they contain significant quantities of plant nutrients such as manganese, cobalt, copper, boron, potassium, etc. There is great need for these elements in both plant and animal growth. By proper selection and control of particle size, a high quality agricultural limestone is produced which meets the several state and federal requirements. Under a sales contract between St. Joseph Lead Co. and the American Limestone Co., St. Louis, Mo., this material is sold and distributed extensively by the latter in the farming areas of Missouri, Illinois, Arkansas, Louisiana, Mississippi and Tennessee.

For recovery of this material versions of a tailing reclaiming system have been developed. In a relatively flat area alongside the mill, provision

(Continued on page 118)

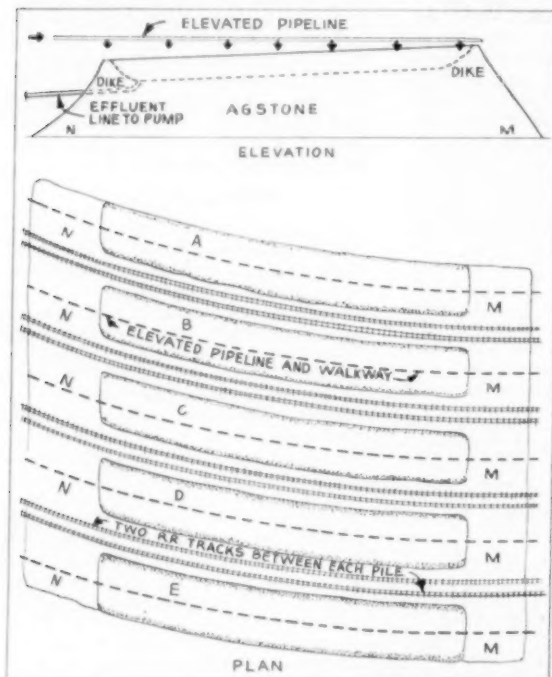


Fig. 4: Plan and elevation of agstone recovery piles. The piles reach about 20 ft. in height and are about 50 x 500 to 600 ft. Filling starts at "M" and is progressively filled toward "N." The effluent, which is mostly non-settling fines flows out to a pump and is sent to the regular tailings pile. Two parallel sets of railroad tracks are between each pile; the dotted lines shown in the plan view are the pipelines. The piles are slightly circular due to the area available.

Buldex, Inc.'s new lightweight aggregate plant; l. to r. are the receiving hopper for raw material, raw material storage silos, kiln dust chambers, dust collectors, quenching towers, kilns, kiln firing room, coolers, bloated material silos, conveyor and crusher house, finished material storage silos, and loading facilities



SHALE EXPANDED IN 125-FT. ROTARY KILNS

BULDEX, INC., a company recently organized to produce and market lightweight aggregate and other building materials, is operating a new expanded shale aggregate plant located in the east central part of Kansas on U. S. Highway 59, about a mile and one-half south of the city limits of Ottawa (60 miles southwest of Kansas City, Mo.). The location is ideally suited for supplying the users of lightweight aggregate in Kansas, western Missouri, southern Nebraska, northern Oklahoma and Arkansas. The plant is served by two major rail lines, the Atchison, Topeka and Santa Fe, and the Missouri Pacific. A second arterial highway near the plant provides excellent facilities for truck deliveries.

The factors that were carefully considered in deciding upon the plant location were: (1) proximity to plant of an adequate supply of raw material; (2) a central location to the market to be served; (3) excellent rail facilities and highways for transportation and (4) low cost fuel supply for firing the kilns. In the opinion of the company engineers, these important factors were adequately satisfied in the choice of the Ottawa location. For nearly two years before the final selection of the plant site, marketing surveys were carefully prepared, and many exploratory and drilling operations were conducted with the cooperation of the Kansas State Geological Sur-

vey, in order to find the right shale bed for the raw material.

Many large samples of shale were collected, preliminary laboratory analyses were made in the state geology department, and final test runs were made on the materials in a 30-ft. long pilot plant kiln. The materials that were bloated or expanded were prepared in commercial sizes, test building block were made in commercial plants, and final strength and physical properties were determined in commercial testing laboratories and the University of Kansas concrete testing laboratory. The results of these investigations proved conclusively that the Weston shale was best for the manufacture of an expanded shale aggregate.

During the prospecting operations, large beds of Weston shale were found in the vicinity of Ottawa, Kan. Nearly every kind and type of plant making an aggregate was personally in-

spected by the engineering department, and after thorough studies as to plant investment, operating costs, and the quality and uniformity of the product, rotary kiln firing was decided upon. The Ottawa location had the proper raw material, the rail and truck facilities, the proximity to the market, and was traversed by large natural gas transmission lines. The plant site consists of a quarter section of land along the highway, and the shale deposits are in the quarter section next to the plant site.

Plant Layout

The choice of plant design is unique in that it is along a straight line material flow, neither the raw nor finished material at any time touching the ground. The raw material enters the plant at the south end, and is loaded out as finished material at the north end. A 4-cu. yd. electric dragline is used for removing over-

burden on the shale bed. This overburden varies from 10 to 20 ft. in thickness. The shale bed is blasted and loaded into 5-ton dump trucks for transportation to the plant. There an inclined roadway leads to a receiving hopper into which the raw material is dumped.

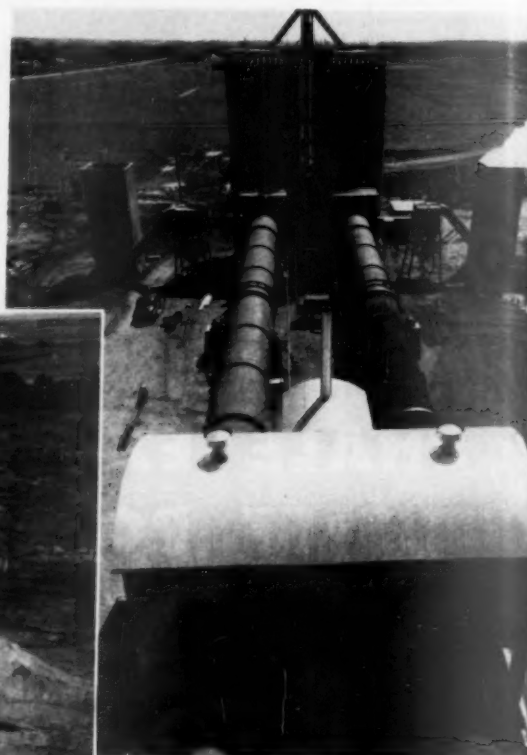
From the receiving hopper, the material is passed over a 4-in. scalping screen, the undersize passing directly to the hopper feeding a bucket elevator and the oversize passing to a crusher. The crushed material then

Close-up showing the receiving hopper for raw material, raw material crusher house and raw material storage silos; dust collector is at extreme right



Right: View of the kilns looking toward the raw feed end of the plant. Dust collectors, fans and quenching towers are clearly shown

Below: Dragline operating in the shale pit. The haulage road leads to the plant in the far background



joins the material passing through the scalping screen to be elevated to two intermediate storage hoppers that in turn feed the belt conveying the material to a secondary crusher. The plus 2-in. minus 4-in. material sized on another screen is crushed to minus 3 in. by the secondary unit, the material then joining the undersize from the scalping screen. All is elevated to two storage silos.

The two storage silos for the 2-in. raw material hold about 600 cu. yd. each; they are 60 ft. high and 22 ft. in diameter and are of precast concrete stave construction.

Dual Production Units

The rest of the plant is built upon a two unit system. Each unit of the system is designed to produce 300 cu. yd. of finished material in a 24-hr. day. From the bottom of the raw material silo, the material is fed onto a belt conveyor into the boot of a bucket elevator that discharges into a spout entering the kiln through the kiln dust chamber. Each kiln is 8 x 125 ft. These are the longest kilns ever to be used in the manufacture of a lightweight aggregate. Previously, kilns as long as 100 ft. have been used, but it was thought that the kiln heat balance could be improved with the additional 25 ft. The kilns have a pitch of $\frac{1}{4}$ in. to the foot and are operated by a two-speed motor, driving the kiln either

at 1 or $1\frac{1}{2}$ revolutions per min.

The raw material is preheated in the long kiln, and reaches the bloating zone within 10 ft. of the discharge end. After leaving the kiln, the bloated material is discharged into a cooler. Each cooler is 50 ft. long and 66 in. in diameter, and turns at a speed of 3 r.p.m. The discharge end of the cooler is provided with a screen section 12 in. long, having 2-in. mesh and formed to the circumference of the kiln. The screen section removes the minus 2-in. material, the oversize going to a roll crusher. Both streams go to a common bucket elevator for elevation to a storage silo. These silos are duplicates of those for the raw material. A double-deck vibrating screen on the top of each silo screens out a sized material that



Bloated material being moved to the gyratory crusher for final crushing

could be used for concrete aggregate. This material can be discharged into a spout so that it can be dropped to a car or truck near the silo, or to ground storage.

From the bottom of the bloated material silos, the material is discharged onto a conveyor belt and taken to a gyratory crusher where it is crushed to minus $\frac{3}{4}$ in. The crushed material is then elevated to the finished material silos. There are two silos for each unit, all the same size and construction as the raw material storage silos. On top of the first storage silo of each unit is a double-deck vibrating screen. At present two sizes are being made, plus $\frac{3}{4}$ in. minus $\frac{3}{4}$ in., and minus $\frac{3}{4}$ in. A conveyor carries the material from the screen to the far bin, so that one bin holds the large size material and the other the minus $\frac{3}{4}$ -in. material. The oversize from the screen's top deck is spouted back to crusher feed.

Shipping

The loading facilities consist of either truck loading or car loading. Each pair of silos is equipped with gates opening into a reclaiming tunnel. A belt conveyor running in the tunnel discharges into an elevator which in turn can load either a truck or car. Scales with automatic weighing are provided for truck delivery, and railroad cars are weighed at Ottawa. The minus $\frac{3}{4}$ -in. material now being produced weighs around

LIGHTWEIGHT AGGREGATE

medium for the hot aggregate and at the same time an adequate supply of preheated air for complete combustion of the fuel. The cooler is lined with firebrick for about one-third of its length. Z-bars are provided at regular intervals, acting as lifting bars to give the air a chance to sweep through the aggregate. The effectiveness of the cooling is shown in a reduction in temperature of the aggregate from

Top left: Interior of kiln room showing the firing hood of one kiln

Left: Instrument and electrical control panel in the kiln firing room

Below: Truck loading facilities

discharges into a reservoir where the dust is settled out and the water reclaimed for re-use in the sluicing system.

Instrument Control

Instrument control panels are provided in the kiln firing rooms. Instruments are used to record kiln bloating zone temperature, kiln back end temperature, and the temperature of the gases entering the dust collector and fan. Firing is controlled radiometrically and can be either manual or fully automatic. A multiple draft recorder provides readings of the draft at the back end of the kiln and the entrance to the fan. The main draft damper as well as the tempering damper are electrically operated from the instrument panel in the kiln room. Signal lights indicate to the kiln operator that the raw material is flowing into the kiln and that the bloated material is flowing into the storage silos.

Electrical control panels are also located in the kiln firing room. Push-buttons control all motors used from the feeding of the raw material into the kilns to the placing of the expanded material into the storage silos. The motors handling the raw material from the receiving hoppers through the elevators, conveyors and crushers into the raw material storage silos are controlled from a station at the receiving end, and the motors operating the conveying, crushing and screening of the bloated material, as well as storage and loading facilities, are controlled from a panel at the finished end of the plant. Electrical circuits are provided with interlocks, so that motors can only be started or stopped in a predetermined sequence. The induced draft fan and kiln motors are exceptions. Emergency pushbutton stops are also provided.

The 600 cu. yd. daily capacity of the plant will soon be reached. The product is marketed under the trade name of "Buildex." Main offices of the company are located in Ottawa, Kan.

Volcanic Ash

RECENT STUDIES by the Kansas State Geological Survey have revealed the presence of volcanic ash deposits in 38 Kansas counties. The deposits range in thickness from a few inches to more than 30 ft. and were said to have been transported by wind many thousands of years ago from volcanoes somewhere in the Rocky Mountain belt.

Principal uses of the ash, as produced commercially in Kansas, have been as abrasives, in sweeping compounds, in concrete mixtures, and as a ceramic glaze for Kansas potteries. Studies are now underway to determine other ceramic uses and to determine the value of the ash in the production of lightweight aggregate, cellular block, glass and inert filler.

55 lb. per cu. ft. and has a gradation as follows:

Percent passing $\frac{3}{4}$ in.	100.0
Percent passing No. 4	77.0
Percent passing No. 8	53.3
Percent passing No. 16	34.3
Percent passing No. 30	19.7
Percent passing No. 50	10.4
Percent passing No. 100	5.0

Kiln Firing

Each kiln is provided with a combination natural gas and fuel oil burner. Natural gas is the fuel regularly used, fuel oil only being used in the colder winter months when the natural gas supply is curtailed. Complete fuel oil storage, pumps, heaters, and an auxiliary boiler are provided for this purpose. The fuel oil supply is No. 5 oil. Natural gas is supplied to the burners at pressures varying from 2-5 p.s.i. and atomization for either fuel is supplied by means of high speed centrifugal air compressors operating at a discharge pressure of 24 to 30 oz. These compressors supply the primary air for combustion and atomize the oil. This amounts to about 25 percent of all the air that is required for complete combustion, the balance of the air being drawn into the kiln by the induced draft fans.

The discharge end of the kiln is connected to the cooler by means of a movable hood that fits reasonably tight, so that all of the air drawn into the kiln must come through the rotary cooler, providing a cooling

around 1900 deg. F. leaving the kiln to a temperature of about 125 deg. F. at the cooler exit.

The hot or bloating zone of the kiln is maintained at a temperature of from 1950 to 2050 deg. F. The temperature of the gases leaving the kiln is around 900 deg. F. and the temperature of the gases entering the dust collector and induced draft fan is maintained at less than 800 deg. F. by means of a tempering damper. The dust and gases from the kiln are drawn through a multiple cyclone-type dust collector by the induced draft fan. The fan discharge is passed into a quenching tower before the gases are vented to the atmosphere. This tower is equipped with spray nozzles and checkerwork to break up the gases and thoroughly saturate them. A sluicing system is provided to remove the dust that collects in the kiln dust chamber, the hopper of the regular dust collector, and the slurry that collects in the bottom of the quenching towers. The sluiceway

Sand and Gravel



Dragline loading hopper of portable field plant at Becker County Sand & Gravel Co.'s Fayetteville, N.C., operation

De-sanded pit material is sent to the main plant over conveyor suspension bridge at Becker County Sand & Gravel Co.'s Fayetteville, N.C., operation

By WALTER B. LENHART

PORTABLE PLANT IN PIT TO REMOVE FINES

BECKER COUNTY SAND & GRAVEL CO., INC., at its Fayetteville, N.C., operation uses a company-designed and company-built portable field plant of unusual design. The deposit has a high percentage of sand in it and the main purpose of the portable field plant is to scalp out some of these fines and return them to the pit.

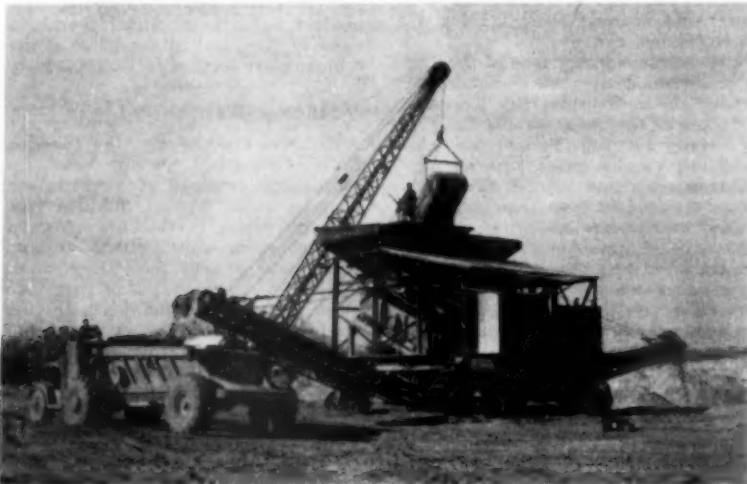
As can be seen from the illustrations, the unit, which is driven by diesel-electric power, consists of a deck on which is mounted three 6-x 14-ft. dry Allis-Chalmers Ripl-Flo vibrating screens mounted in a single row, above which is a steep hopper.

The oversize from the single-deck screens is carried on a boom conveyor and the material loaded to a fleet of three Heil and two Euclid bottom-dump trucks. The fines from the screen fall to a second and shorter boom conveyor and are returned to the pit. A Lima diesel-powered dragline does the primary loading. The deposit has about 20 ft. of commercial aggregate in it, with a marl forming the base.

The platform is mounted on four crawler treads and the Lima dragline "inches" it along as needed. As the final washing and screening plant

has a capacity of 350 t.p.h. and works on a 11½-hr. basis, a considerable area is worked over monthly. The relatively flat country also helps production.

The deposit is located on the south bank of the Cape Fear river, a navigable stream that flows into the Atlantic ocean near Wilmington, N.C. Three locks make it possible for



General view of the portable field plant, consisting mainly of three single-deck vibrating screens. Oversize is loaded to bottom-dump trucks (left) for delivery to belt conveyor over the river to main plant; the fines are returned to the pit (right)



The portable field plant is mounted on four crawler treads and can be "inched" along from spot to spot as needed

boats of relatively shallow draft to go as far upstream as Fayetteville. The washing and screening plant is on the opposite bank of the river.

The general plan of operation is to haul the pit-recovered material about one-half mile, the distance depending on the location of the portable field hopper. The trucks unload to a storage pit which is designed to let the field plant run 8 hr. per day and yet have sufficient material to run the main plant two shifts if necessary. A stiff-leg clamshell is available at this storage pit for any intermediate handling of material. A

steel bridge of substantial proportions has been built across the river and on this a catwalk is provided alongside the 24-in. Barber-Greene belt conveyor system used to deliver the material to the main plant. If no bridge had been provided a 9-mile haul would be necessary.

The plant provides gravel, but 1 in. is the top size as the pit is predominately finer aggregates. A rotary scrubber screen does the primary screening and sand is recovered by two 36-in. single Eagle screws that operate in 42-in. x 25-ft. tanks. Near the final loading point a vibrating



A steel bridge supports the 24-in. belt conveyor that moves material from the deposit to the main plant on the opposite side of the river

screen has been provided and more sand can be wasted there if desired.

All tailings from the plant are sent to a retaining basin and no appreciable amount of solids is allowed to get into the river. Shipments go out by rail and truck.

The Fayetteville operation is under the general management of the company's southeastern office at Cheraw, S.C., where Earl Mullen is general manager and M. C. Evans is general superintendent. C. W. Gelder is superintendent of the Fayetteville operation and O. E. McNulty is office manager.

Becker County Sand & Gravel Co. has plants in North and South Carolina. Locations are Cheraw, Camden and Kathwood in South Carolina and Marion and Fayetteville in North Carolina. The main office of the company is at Crosby, Minn., from which the company operates 19 aggregate processing plants. In the November, 1951, issue of ROCK PRODUCTS, page 78, we described the Detroit Lakes, Minn., plant where a new sand sizer—the only one in the world to be used in a sand and gravel plant—was described. The Kathwood, S.C., plant is currently producing all the sand required for the concrete



Bottom-dump trucks unload to a storage pit at the belt conveyor which carries the material across the river to the main plant. A stiff-leg clamshell rig is available for intermediate handling

in the large H-bomb plant near Aiken, S.C. (see ROCK PRODUCTS, May, 1952, page 68).



A vibrating screen near the final loading point makes it possible to eliminate more sand from the product if desired

Geologic Guidebook

THE CALIFORNIA DIVISION OF MINES has announced the publication of Bulletin 154, "Geologic Guidebook of the San Francisco Bay Counties—History, Landscape, Geology, Minerals, Industry and Routes to Travel." The book, containing 392 pages, consists of contributions from 28 authors and is a semi-technical and authoritative treatise of the geology, mineral resources, industries and history of the area.

The section on "Mineral Industry" describes the rock and minerals used in the industries in the area and includes building stone and aggregate, limestone, volcanic rock, serpentine, magnesite, diatomite, clay, quicksilver, salines, manganese, chromite and mineral fuels.

The book also includes more than 300 photographs, drawings and maps. Copies may be obtained from the California Division of Mines, Ferry Building, San Francisco 11, Calif., for \$2.50 per copy.

Permanente Annual Report

PERMANENTE CEMENT CO., Oakland, Calif., in its 1951 annual report to stockholders, reported record production and the highest sales and gross earnings in its history. Henry J. Kaiser, president, stated that the company had helped meet a severe shortage of cement for defense construction, housing, industrial building, and power and flood control projects in California, the Pacific Northwest, Alaska and Hawaii by raising annual capacity 25 percent to 7,000,000 bbl. beginning last March.

Capacity and efficiency were also increased by expanding distribution facilities along the Pacific Coast and by a new process for the re-use of kiln dust (see ROCK PRODUCTS, January, 1952, page 164).

Earnings before federal taxes for the fiscal year ended January 31, 1952, reached \$7,202,770, more than one-fifth greater than the previous year. The increased production, sales and gross earnings substantially offset the increased tax burden, enabling the company to maintain its former rate of dividend payments to stockholders.

Mr. Kaiser stated that evaluation of the company's prospects for the coming year indicates continuation of strong demands for cement, requiring fullest operation of production capacity and he predicted that 1952 will be another year of record sales. The belief of a continued strong demand for cement was based on the requirements of military and allied defense construction, the backlog of civilian construction applications, and requirements of the flood and control projects now being planned. Another contributing factor was said to be the major building boom taking place in the Hawaiian Islands, due to a large increase in tourist travel.



Placing a lightweight reinforced concrete window lintel

LIGHTWEIGHT BUILDING UN LIME AND SILICEOUS M

Main factory of International Ytong Co. in Sweden



LIGHTWEIGHT CONCRETE today is recognized as one of the greatest improvements in the field of building materials and house construction. The development has followed different lines in different countries, due to local conditions and natural resources.

The variety of lightweight concretes can be classified into four main groups, according to how air to give porosity is introduced into the material: (1) lightweight aggregate concrete, (2) chemically aerated concrete, (3) concrete aerated with foam, and (4) "no-fines" concrete.

In the United States, as well as in many other countries, the first group has so far dominated the development, partly due to a good supply of excellent lightweight aggregates, partly to highly mechanized concrete block machinery which was developed to a great extent even before the first attempts with lightweight concrete were made.

In Sweden, however, the second group has not only dominated the field from the beginning 30 years ago, but it has revolutionized the whole building industry. It is quite remarkable to notice the extensive use of a new building material in a country with such old traditions and such excellent supplies of clay brick and especially wood construction materials. Probably 70-80 percent of all new home units are built mainly or partly of lightweight concrete, mostly chemically aerated concrete.

The cause of this development is to be found partly in the low cost of the material and partly in the outstanding qualities of the material, which probably has lower density and higher strength than any other lightweight concrete in the world, in the author's opinion.

After the second world war a great number of other countries adopted the "Swedish line" and are now planning or building plants on a license basis.

Lightweight Construction

The material, known as Ytong and originally invented by Dr. Axel Eriksson, has been developed by a well-known limestone and marble quarrying company which owned natural deposits of the required raw material. It is manufactured today in the form of large block for non-loadbearing external and internal walls, insulating slabs and reinforced roof and floor slabs, window lintels, etc.



Close-up of insulation slabs used as the outside form in building with monolithic concrete

The block are used for construction of up to 5-story buildings in non-loadbearing construction, in which the body of the building only weighs half, and in certain cases only one-third, that of traditional materials. What this improvement means for the builder in the way of good insulation and foundation savings is obvious.

Another type of construction is the reinforced monolithic concrete building of 12-15 stories or more, externally insulated with Ytong slabs, which also serve as forms for the casting of the concrete structure. The saving of formwork in this connection is very important, especially in times of wood shortage all over the world.

It should be noted that the insulation is put on the outside of the building, contrary to the practice in other parts of the world. The advantage of this is to be found in better heat capacity of the house and in the fact that the surface of lightweight concrete is far better suited for plastering than that of plain cast concrete.

The simple way in which window and door lintels can be used is both satisfactory and safe and is characteristic of the material. Such lintels are used extensively, even where the building material is of older traditional types.

In the building of homes, as well as in industrial buildings, reinforced roof and floor slabs have become more and more common. This has made possible simple roof construction, and on the whole it can be said that these can be used on most industrial buildings.

*International Ytong Co. AB, Stockholm, Sweden.

NG UNITS OF AUTOCLAVED US MATERIAL

International Ytong Co., Sweden, manufactures chemically aerated lightweight block and precast floor, roof and insulation units

By ERIC AHLSTEDT*



Five-story apartment using lightweight concrete block in non-loadbearing walls

These reinforced slabs have been used for floors in different types of homes, mainly, however, in smaller houses. In this connection it should be pointed out that floors in Swedish apartment houses, walls of which are loadbearing lightweight concrete, and also in multistory buildings made out of monolithic concrete, are generally cast in monolithic concrete, contrary to the common practice in most countries in Europe where hollow floor block are used extensively.

Many of the types of construction have been developed hand in hand with the existing housing policy. Regulations, trade unions and supplies of raw materials also had to be considered. What can be said to be ideal under Swedish conditions, therefore, is not always ideal for conditions existing in other countries, where other factors have to be considered.

The Swedish lightweight concrete Ytong now is manufactured in four plants for the domestic market, with a total capacity of approximately 42,000 cu. ft. per day. The total annual production is large enough to build a city of about 80,000 inhabitants, according to Swedish conditions. Several plants are under construction in other countries where different raw materials will be used. Approximately 10 percent of the Swedish Ytong output is reinforced material and the rest standard building block.

Ytong Production

Ytong is manufactured out of a silica-rich shale ash and unslaked lime mixed in the proper proportions. Many varieties of siliceous materials can be used as raw material. For instance, ordinary sand, coal waste, burned coal waste, fly ash with a low coal content, brick waste, blast furnace slags, pumice and similar materials can be used. The lime for the process can either be burned separ-

ately as in standard practice or together with some silica-rich materials which have sufficient heat values to calcine the limestone. This can be done in some kind of kiln or on a sintering bed. Since the lime need not be of high quality, any non-dolomitic limestone can be used.

The material can be manufactured more or less efficiently, depending on the raw material used. If one looks at the circumstances in Sweden, where the necessary shale ash is obtained through burning the bituminous oil shale together with certain quantities of limestone in so-called field kilns, the calorific economy is extremely good. Compared to a similar cement product, only 25 percent of the fuel is needed.

Production of lightweight concrete products using this method, however, requires a relatively high capital investment, but not much more than a modern brick plant. The necessary labor hours per manufactured unit are considerably less than those required for brick manufacture. The production of Ytong requires only 2 man-hours per cubic meter (35 cu. ft.), including everything: quarrying, raw material preparation, manufacture and shipping. Actual production requires only 0.6 man-hours per cu. m.

Manufacturing Process

The burned shale ash and the lime are conveyed to the crushing section of the plant, already mixed in proper proportions, and are transported through bucket elevators to raw material bins, from which the material is put over feeders to the tube mills. Here it is milled before being transported to silos. The mixing grade and the fineness of the pulverized material is carefully controlled and a further homogenization is achieved with mechanical stirring devices and by air agitation. Screw conveyors and

elevators carry the shale-lime "flour" to the mixing station where it is intimately mixed with water and where aluminum powder or another foaming agent, together with certain chemicals, are added. The rather thin slurry is put into molds where it rises and presets. After a certain time it is cut into block and slabs of desired dimensions. By varying the proportions of raw material, the final material can be made in different densities. After cutting, the units are cured in autoclaves using saturated steam at approximately 143 p.s.i. High pressure steam curing, of course, accelerates the setting, and after a relatively short time the material can be transported to the storage yard where it is handled by mechanical devices and prepared for shipping.

Material Characteristics

Ytong block with a normal density in the dry state of 41 lb./cu. ft. (0.65



Erecting nine-story building of reinforced concrete with Ytong block being used as outside insulating surface as well as the outside form. Note the use of the sliding-form method of construction and that the exterior form is light, only being used to keep block aligned and in place until concrete is placed

LIGHTWEIGHT UNITS

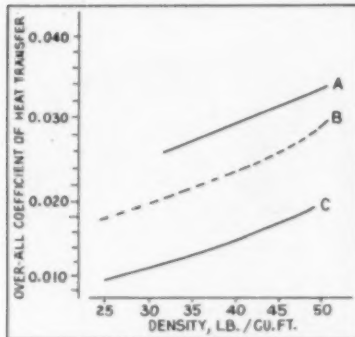


Fig. 1: Thermal conductivity and densities. A—outside walls of Ytong block; B—outside monolithic concrete walls insulated with Ytong slabs on the outside; C—Ytong in dry state

kg./cm.³) are mainly used for non-loadbearing outside and inside walls where the loads on masonry do not exceed 86 p.s.i. (6 kg./cm.²) according to the "Swedish Building Code of 1950." Ytong with a density of 0.5 (31 lb./cu. ft.) is used for loadbearing outside walls in houses and up to 3-story buildings and as panel walls in skeleton frame houses where the loads on masonry do not exceed 43 p.s.i. (3 kg./cm.²)

Partition walls are manufactured of Ytong with density 0.65 (41 lb./cu. ft.) and mainly used for partitions, but in some cases also for insulation of certain portions of buildings.

Insulation slabs are manufactured of Ytong density 0.4 (25 lb./cu. ft.) and are used for insulation of mono-

lithic concrete or brick, floors, concrete roofs, etc.

Lintels are manufactured for various permitted loads from 600 to 1800 kg./m. (400 to 1200 lb./ft.). According to the kind of loading and type of lintel, these are manufactured using different reinforcement. If the

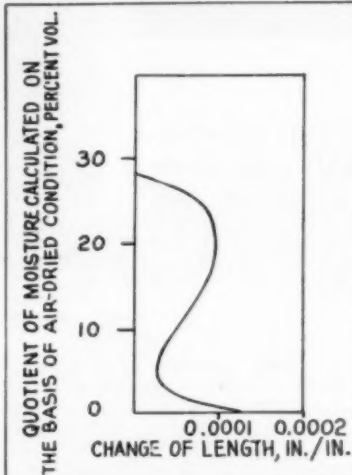


Fig. 2: Shrinkage of Ytong concrete, weighing 41 lb. per cu. ft., in drying from maximum moisture content after steam curing

load is not to exceed 600 lb./ft., (900 kg./m.), the reinforcement is spot welded and anti-corrosion treated and placed directly into the Ytong slurry. Where the loads exceed 600 lb./ft., however, the lintels are manufactured

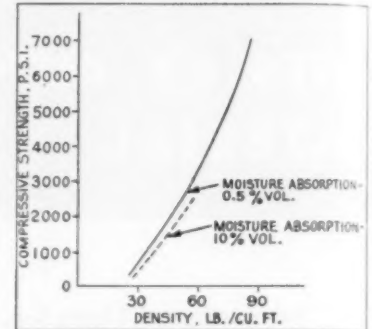


Fig. 3: Compressive strength of lightweight Ytong

with reinforced concrete cores in the Ytong slurry.

Roof Slabs

Reinforced roof slabs are normally manufactured of Ytong density 0.5 (31 lb./cu. ft.). However, if special conditions require stronger roofs, the densities can easily be increased. The application of the reinforced Ytong roof slabs is very simple. Of course a wide enough end support is required as well as a connection between the different slabs. This is achieved by placing reinforced rods in grooves milled along the top edges of the slabs. These grooves are afterwards filled with a cement mortar before the roof is covered with asphalt paper.

There are certain moisture and condensation problems in places of high humidity. It can be anticipated that the reinforcement in the slabs will be damaged by this moisture in spite of the anti-corrosion treatment. Under such unfavorable conditions it is recommended that "ventilated" roofs be constructed. This can be done in many different ways.

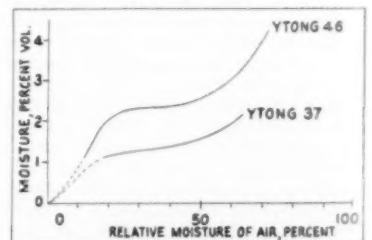


Fig. 4: Water absorption curve for Ytong weighing 37 and 46 lb. per cu. ft.

An investigation was made in the autumn of 1949 by the State Testing Station of 18 Ytong roofs in different parts of the country that were mainly laid from the beginning of 1930 to the beginning of 1940. The results showed that none of these roofs received any damage detrimental to the building. More than 40 percent of those showed no damage whatsoever and where slight damages were noticed it was because of damaged coverings or indirect outside causes.

Table I. Data on Ytong block (31 and 41 lb./cu. ft.)

Length 20"	Height 10"	Thickness							
		7"	8"	9"	10"	11"	12"	13"	14"
Weight—unplastered walls, lb./sq. ft. ab.	Ytong 41	28	32	36	40	43	47	51	55
	Ytong 31	23	26	29	32	36	39	42	45
Material per sq. yd. of wall	Block incl. 4% waste, pcs.	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	Mortar incl. 20% waste, cu. ft.	0.43	0.51	0.57	0.63	0.69	0.75	0.83	0.89
Heat coefficient (k) at plastered walls*	Ytong 41	0.152	0.137	0.125	0.115	0.106	0.099	0.091	0.087
	Ytong 31	0.129	0.116	0.105	0.096	0.088	0.082	0.077	0.072

*According to the Swedish building standards.

Table II. Data on partition wall slabs of Ytong (41 lb./cu. ft.)

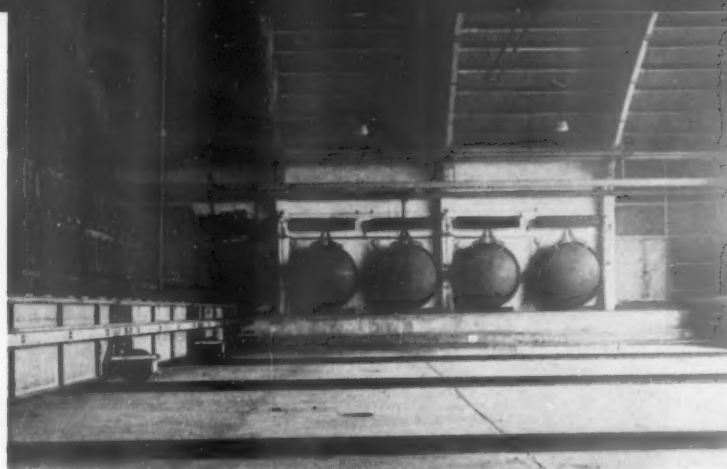
Length 20"	Height 10"	Thickness				
		2"	2½"	4"	5"	6"
Weight—unplastered walls, lb./sq. ft. ab.		8	11	15	19	23
Material per sq. yd. of wall	Slabs incl. 4% waste, pcs.	6.5	6.5	6.5	6.5	6.5
	Mortar incl. 20% waste, cu. ft.	0.12	0.18	0.25	0.31	0.37

Table III. Data on insulation slabs of Ytong (25 lb./cu. ft.)

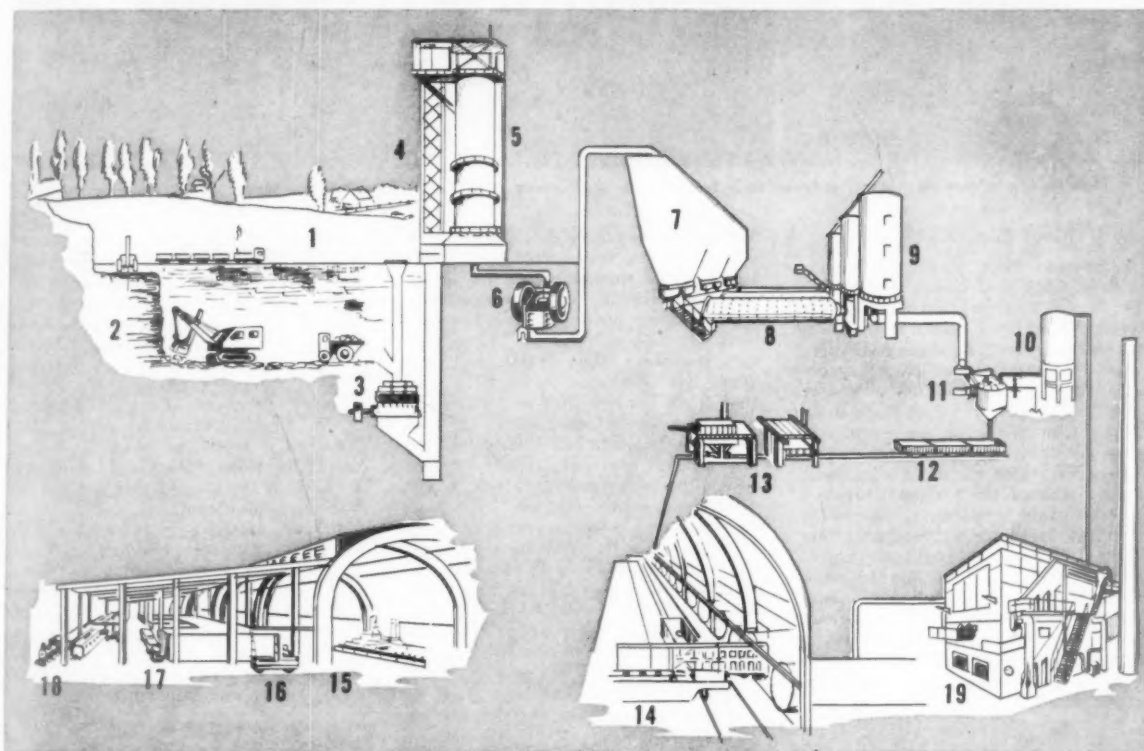
Construction	Over-all coefficient of heat transfer, k Weight, g. lb./sq. ft.	Insulation thickness			
		2 1/4"	4"	5"	6"
6-in. concrete wall + Ytong insulation	k	0.180	0.140	0.119	0.105
	g	16	16.8	17.3	17.8
I-stone (10") + 1.6 brick + Ytong insulation	k	0.124	0.104	0.091	0.082
	g	18.4	19	19.6	20.5
6-in. concrete roof + Ytong insulation	k	0.152	0.117	0.100	0.086
	g	16	16.8	17.3	17.8



Dumping raw shale and limestone onto a field kiln with dumpers

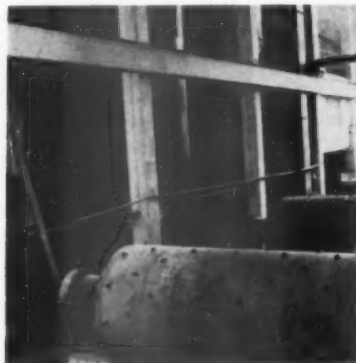
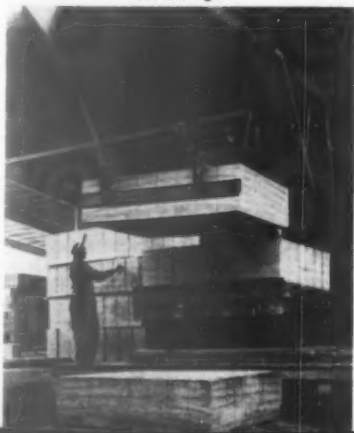


View of some of the autoclaves; the device used to load the autoclaves is at left



Schematic of Ytong manufacture: (1) Limestone quarry; (2) Shale quarry; (3) Coarse crusher for raw material; (4) Elevating arrangement for raw material; (5) Kiln; (6) Crusher for burned material; (7) Silos for burned material; (8) Ball mills; (9) Flour silos; (10) Water container; (11) Mixing station with flour scales; (12) Casting molds; (13) Cutting department; (14) Autoclaves with charging traverse; (15) Storage; (16) Special trucks for loading and unloading; (17) Truck loading; (18) Railroad loading; (19) Steam plant

Unloading lightweight units from the molds for storage



After crushing, the material is sent to tube mills in the plant



The thin slurry is put into molds where it rises and presets



Tools used in lightweight masonry construction in Sweden. Left: Wall course stick. Center: Block cutter. Right: Special wheelbarrow

Floor Construction

Reinforced floor slabs are manufactured mainly of Ytong density 0.7 (44 lb./cu. ft.) to obtain more effective sound insulation. Floor slabs are manufactured in much the same way as are roof slabs. They are designed in each case for the particular loads required and for their own weight together with the reinforcement. Various types of floor coverings can be used on the Ytong floor.

Unreinforced floor slabs are used under certain conditions, in which case they are manufactured of Ytong 0.65 (41 lb./cu. ft.) and with dimensions of 40 x 20 x 4 in. The thickness varies in accordance with the load-bearing requirements. In such cases unreinforced floor slabs are put in between steel girders. The closing up of the joints and edges is done with cement mortar, after which the floor is laid.

Special Tools

Auxiliary tools developed over a period of years have made handling the Ytong block much easier. Among these there is a so-called wall layer stick with which the mason can very simply adjust his wall and produce a neat appearing job. For cutting up Ytong block at the building site there is a Ytong "guillotine" which is made in various sizes for standard block and partition wall slabs. These tools are very effective and practical.

For transport of the Ytong material at the building site, wheelbarrows with a low center of gravity are used. These are fitted with tip rockers, making it impossible for the barrow to tip over. The wheelbarrow can also be used as a lifting device and for distribution of the block on the floor. Apart from this there is a whole series of tungsten carbide type

tools, such as drills for electric motors, scrapers for ducts, etc. These tools can be worked either manually or with electricity or compressed air.

For Ytong customers' service the company has a staff of technicians and engineers that throughout the years has developed methods of getting high quality and economy.

As previously mentioned, the use of Ytong products has been developed under conditions unique for Sweden, which in many cases may not be applicable in other countries. The suggestions and recommendations may therefore only be taken as a proposal and other methods will naturally be developed in every country in accordance with local demand and conditions. This is true primarily with the external finish of the house. Plastering was mentioned as one finish, but the external wall can just as well be covered with shingles of asbestos, panels, or the wall can be faced with brick. The latter construction is generally used in Sweden, especially where the climatic conditions are unfavorable for plastered walls.

Canadian Silica Plant

DOMINION SILICA CORP. has announced that its processing plant, now under construction, will go into production in early July. The plant, which is at Lachine on the Island of Montreal, will enable the corporation to supply high-grade silica to eastern Canada. Canada now imports its silica from the United States.

The corporation's board of directors is composed of John C. Udd, Sheraton Hotels, Ltd., Montreal; Samuel D. Lunt, Hamelin & Lunt, Buffalo; Grant S. Diamond, Electro Refractories & Abrasives Corp., Buffalo; Jean Volpert, Confederation

Development Corp., Montreal; Maurice Gerin, Confederation Development Corp., Montreal; Robert C. Heim, Empire Trust Co., New York; John V. N. Dorr, The Dorr Co., New York; Eric D. B. Kippen, Kippen & Co., Montreal; Donald F. Wolvin, Brudon Corp., Montreal; W. Bruce Kippen, Westcan Corp., Calgary; D. W. S. Mackenzie, Kippen & Co., Montreal; Ivan A. Martin, Royal Securities Corp., Montreal; Anthony A. Kippen, Montreal; and George G. Copeland, Montreal.

Officers of the corporation are Anthony A. Kippen, president; George G. Copeland, vice-president and general manager; Alan C. Pratt, executive assistant to the president; John B. Wight, secretary-treasurer; George J. Arnold, sales manager; and A. J. R. Stethem, assistant general manager and plant superintendent.

Buy Sand and Gravel Firm

TWO NEW COMPANIES, Southern Ohio Mining Corp. and County Concrete, Inc., have purchased the Independent Sand & Gravel Co. at Newton, Ohio. Southern Ohio Mining Corp. will mine and process aggregates and County Concrete, Inc., will sell aggregates and ready-mixed concrete. Principal officials of the new companies are W. Russell Warner and R. B. W. Chatfield. John Fogle and Mrs. Anna Van Hook were the former owners of Independent Sand & Gravel Co.

Opens New Offices

UNITED STATES GYPSUM CO., Chicago, Ill., recently opened new offices in Chicago at 300 West Adams St., occupying three floors, totalling approximately 62,000 sq. ft.

St. Clair Lime Co., Sallisaw, Okla., produces shaft kiln lime, riprap, agstone and commercial aggregates



Sallisaw, Okla., operation of St. Clair Lime Co. The belt at left serves the secondary crusher and delivers to screen over bin in center. Bins and screens at right are for sugar refinery limestone. The hammermill at right center is diesel driven. Material in the center bin can also go to the hammermill by means of a short stub conveyor. The hammermill in the left background is used in preparing agstone to meet Arkansas specifications

Wide Range of Stone Sizes

ST. CLAIR LIME Co., Sallisaw, Okla., has vertical lime kilns and a hydrating plant at Sallisaw, in the east central part of the state and about 25 miles west of the Oklahoma-Arkansas state line. Up to about five and one-half years ago the company purchased the kiln stone, but at that time it opened its own quarry along the Kansas City Southern railroad about 12 miles from the kilns. Agricultural limestone graded to meet either Oklahoma or Arkansas specifications is an important part of the rock plant's production.

Recently the company secured large tonnage contracts to supply Mass-Thornton Co., Inc., with riprap for

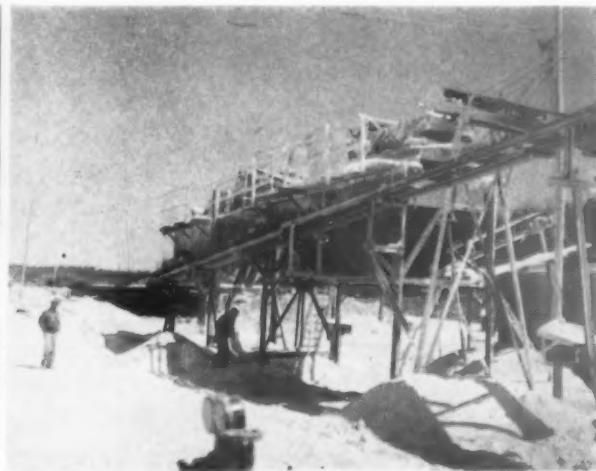
the Texarkana dam and other projects in the general area.

Construction of dams is an important outlet for stone of all kinds in Arkansas and Oklahoma. At Spavinaw, Okla., the city of Tulsa, early in 1952, completed a concrete dam to augment the domestic water supply from an older dam, also at Spavinaw. The Ft. Gibson dam is practically completed (see the December, 1948, issue of ROCK PRODUCTS, page 98). The Tenkiller dam has been completed with work going ahead on power installations. These are both Corps of Engineers projects and are concrete structures, all in northeastern Oklahoma. Pensacola dam, an older con-

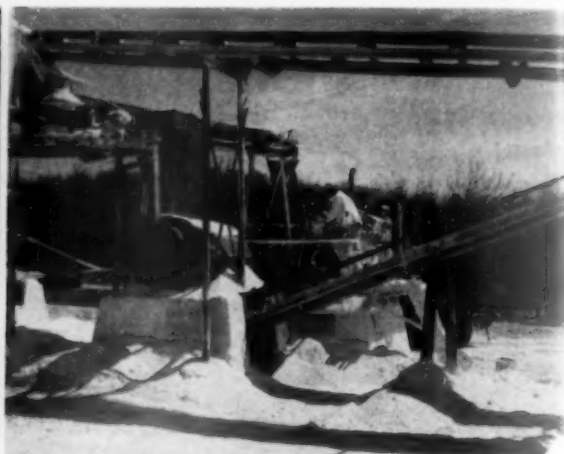
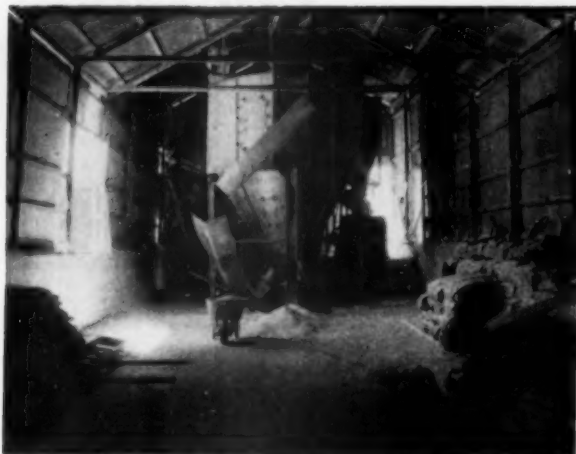
crete structure, is also a large dam in the same area, and Dennison dam, of earth fill, near the Texas-Oklahoma border, is another important structure.

In Arkansas the Blakely Mountain dam near Hot Springs nears completion, as does Bull Shoals dam. In Texas, funds have been appropriated for nine reservoir and dam projects of which \$4,000,000 is earmarked for the Texarkana project (officially designated as a Texas project). These are all Corps of Engineer projects.

Riprap at Sallisaw is defined as stone from 75 to 1300 lb. in weight. Production of this stone is very simple, yet effective: the quarry-run ma-



Left: Primary crusher is at upper left. The truck (center) is unloading to the pan conveyor serving the secondary crusher (center foreground). Ground stored fines can thus be sent to the plant, by-passing the primary crusher. Right: Screens over bins for commercial stone and agstone



Left: Air separator for finer sizes of limestone dust. Right: One of the diesel driven hammermills; this mill prepares sugar refining limestone

material is delivered to a truck hopper under which is an apron feeder, and the stone is put over a Simplicity 4- x 10-ft. heavy-duty scalping screen that has an 8-in. square perforated steel plate screen deck. The oversize falls into open gondola cars for shipment. The undersize falls to a short stub conveyor and is reloaded to trucks. These fines are then sent to the crushing plant for processing into commercial aggregates and agstone. The deck of the scalper screen has been reinforced with a steel rail that extends along the axis of the screen. A small amount of special riprap (almost jettystone) that weighed up to 5 tons has passed over this screen without damaging the screening equipment.

The quarry has been opened up on the side of a hill, therefore stripping is not too serious a problem. The

stone in the upper part is a high calcium limestone; this is the type sent to the kilns at Sallisaw. The bottom of the quarry is a dolomitic stone which is being shipped as riprap, though as mentioned the fines are used for agstone and concrete aggregates. A 1½-cu. yd. Lorain shovel does the primary loading.

The company at one time had given consideration to going underground for stone. The set-up for such an operation appears to be ideal. However, the management decided against this because of the possibility of encountering lenses of dolomitic stone in the high calcium beds which would complicate underground mining quite seriously.

Plant Details

The main plant is semi-portable but is mounted permanently. The primary

crusher is a 20- x 36-in. Cedarapids and the secondary a 10- x 36-in. unit of the same make. For reduction of the agstone there are three 20- x 40-in. Dixie hammermills, each directly connected to a Caterpillar diesel. Similar diesel engines drive the primary and secondary crushers individually. In addition to these five power plants, there are three Caterpillar diesel-electric sets for generation of electric power for the conveyors and for miscellaneous uses. The rock processing involves the use of seven vibrating screens: one three-deck 4- x 12-ft.; four 4- x 12-ft. double-deck, and two 4- x 8-ft. double-deck. All of them, mounted over steel bins, operate dry. The throughs from the fine screen are sent to a Raymond whizzer dust collector and the material collected is packed in bags by a St. Regis packer. The fine dust is used for rock dusting in the coal mines of the area.

The agricultural limestone specifications for Oklahoma permit a coarser grind than does Arkansas. The former allows up to 5 percent of plus No. 4 material. For Arkansas, the agstone must all be minus 8 mesh. The first set of hammermills produces most of the coarser agstone and the second set makes the finer sized stone. The plant operates without cover except for the dust collector and bagging installation. Steel hopped-bottom truck bins are available for truck loading. The plant later may be partially enclosed.

During the winter months certain types of customers must be supplied burned lime as well as other types of crushed limestone, regardless of the season or weather conditions. During those periods agstone and other materials must be stockpiled. The handling of both dolomitic and high calcium liming materials further complicates the stockpiling situation; even the fines from the 8-in. riprap screening operation must, at times, be stockpiled. To help compensate for this,

(Continued on page 158)



In producing riprap, the quarry-run material is delivered to a hopper under which is an apron feeder and the stone is then passed over a heavy-duty scalping screen. The oversize falls into open gondola cars for shipment as riprap. The undersize falls to a stub conveyor and is loaded into trucks for delivery to the crushing plant for processing into aggregates and agstone

**Bryan Rock and Sand Co.
increases production at
North Carolina quarry by
adding large capacity
dump trucks and moving
primary crusher to quarry
floor**



General view of primary crushing plant on quarry floor and belt conveyor to new surge pile at Bryan Rock and Sand Co.'s Neverson, N.C., operation. The surge pile can spill over into the quarry, giving added storage

Large Quarry Trucks Speed Production

THE NEVERSON, N.C., QUARRY of Bryan Rock and Sand Co., Inc., is one of the more progressive crushed granite operations of the country. Since our complete description of the operation in the July, 1948, issue of *ROCK PRODUCTS*, steps have been underway to increase production by more efficient methods, taking advantage of up-to-the-minute equipment that is available. The operation was formerly known as the Southern Aggregates Corp. Early in 1952, as an illustration, the company purchased and placed in use three 50-ton capacity, Euclid rear-dump trucks. These large units are powered with twin General Motors diesels with Hydramatic drives and use ten 16.00 x 24 Goodrich tires.

During 1951 the primary³ crusher was moved to the bottom of the quarry so that the haul is a matter of 400 to 500 ft.—far enough away so that shovels can be moved up near the new crushing plant during secondary blasting and still not have the equipment damaged by flying rock. The primary crusher is a 48-x 60-in. Allis-Chalmers jaw crusher with smooth jaws; this is fed by a 60-in. apron feeder.

The jaw crusher was formerly set on the rim of the quarry and the older fleet of trucks (16 trucks were available for the work) hauled along the winding road from quarry floor to crusher. By elimination of the uphill haul, the three big trucks will be able to take care of most of the quarry haulage, augmented occasionally by the use of three trucks of smaller capacity. At the time of inspection the trucks were operating without sideboards. Without sideboards, they held about 34 tons. Primary loading is done by a 3½-cu. yd. Lima 1201 shovel and by two 2½-cu. yd. 80-D Northwest shovels.

On the rim of the quarry and in the approximate location of the original site of the primary crusher, a surge pile has been provided. The surge pile is small, having a live capacity of about 1000 tons. Some spillover from the surge pile can fall back into the quarry, so in an emergency 30 to 50 carloads of additional rock can be secured.

The primary crusher is set to 9½-in. opening, though some rock gets into the surge pile of larger size. A 48-in. B. F. Goodrich belt serves the surge pile. This belt is driven through a Link-Belt herringbone drive by a General Electric motor. A heavy-duty Syntron electric vibrator feeds the reclaiming belt from

chines have had an additional air compressor mounted on the main drill carriage so two 500-c.f.m. electric-driven compressors are available. Holes are drilled to 98-ft. depths using 35- and 20-ft. drill stems as required, using tungsten carbide bits.

The Neverson operation features the use of a 30-in. Allis-Chalmers gyratory crusher for secondary crushing and two 4-ft. standard Symons cone crushers as tertiary units. A 3-ft. Symons cone and a 48-in. Tel-smith Gyrasphere are available for final reductions. F-600 and F-800 Tyler screens are used in the plant with an Allis-Chalmers Ripl-Flo screen used at the car-loading section for rinsing purposes.

The office of Bryan Rock and Sand Co., Inc., is in Raleigh, N.C. J. E. Bryan is president and L. B. Hughes is purchasing agent. Granville Rogers is general superintendent at Neverson and James Raybon is quarry foreman.



The primary crusher was moved to the quarry floor to shorten the haul of blasted material to between 400 and 500 ft.

the surge pile. By the changes and additions listed here the capacity of the plant is now about 1000 t.p.h.

In the July, 1949, issue of *ROCK PRODUCTS* was described in considerable detail the experience record of this company with respect to the Quarrymaster drills, which at that time had been in service a short time. The company now has three of these drills, one of which is at the Rolesville, N.C., operation. The older ma-



An additional air compressor has been mounted on the drill rigs

Cement



Cement storage silo and packhouse of Ideal Cement Co.'s New Orleans terminal

Ideal Cement Co.'s New Orleans cement terminal, with 120,000 bbl. storage capacity, is distribution outlet for Mobile and Baton Rouge plants

By L. DAVID MINSK

CEMENT PACKING AND LOADING TERMINAL

IDEAL CEMENT CO., Denver, Colo., has recently completed and put into operation a packing and loading terminal in New Orleans, La., as a distribution center for its Mobile, Ala., and Baton Rouge, La., plants. The purpose of the terminal is to facilitate delivery of cement in the New Orleans area which is growing rapidly as an industrial center. The value of industrial and residential construction in

New Orleans has increased substantially since 1939, while its population has increased more than 16 percent.

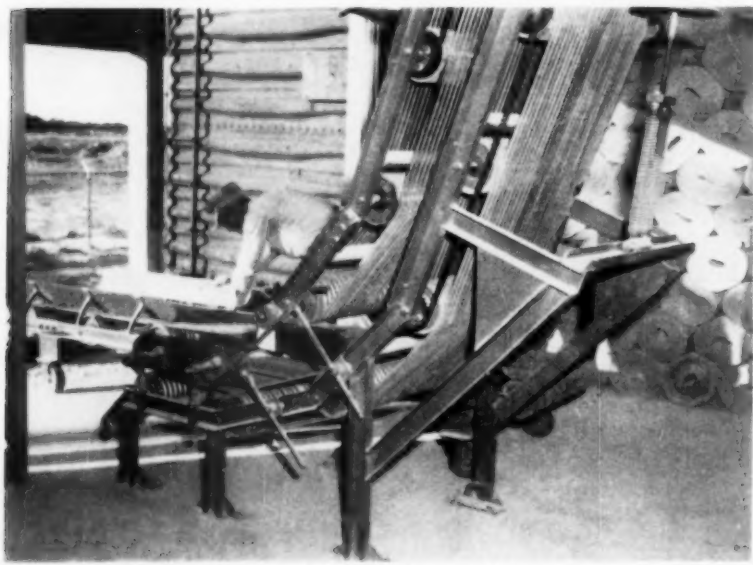
The terminal is located on the Industrial Canal near Lake Pontchartrain and consists of an unloading dock, storage silos with a capacity of about 120,000 bbl., a packhouse for loading cement in bulk or sacks, storage space for empty sacks, wash and change rooms, and office facilities. The

silos and the adjoining packhouse are of reinforced concrete. There are six silos 35 ft. in diameter and 85 ft. high with a capacity of 17,000 bbl. each and two interstice bins with a capacity of 9300 bbl. each. The packhouse is a three-story building which is 93 ft. wide and 104 ft. long, with reinforced concrete canopies on both sides over the loading tracks.

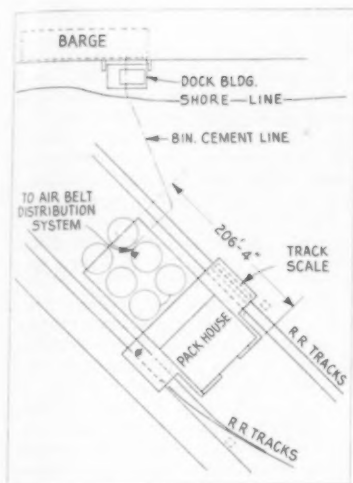
Bulk cement is transported to the terminal from the Mobile and Baton Rouge plants in self-unloading barges, each having a capacity of 7500 bbl. The barges are 195 ft. long and 35 ft. wide and are towed by a 400-hp. twin-screw tug boat. A Sauerman drag in the hold of each barge is used to draw the cement to a hopper over an 8-in. Fuller-Kinyon pump which transports the cement to the storage silos through an 8-in. pipeline. Compressed air for the pump is supplied by a Fuller C-300 compressor driven by a 200-hp. motor and housed in a reinforced concrete building at the dock. Due to the movement of the barges during unloading, reinforced rubber hoses are used for the connections between the barge and shore installations on both the air and cement lines.

Cement is pumped 400 ft., with a rise of 90 ft., to an alleviator on top of the storage silos. The alleviator discharges into the distribution system to the various storage silos and the exhaust is connected to a Norble No. 156A automatic bag-type dust arrester.

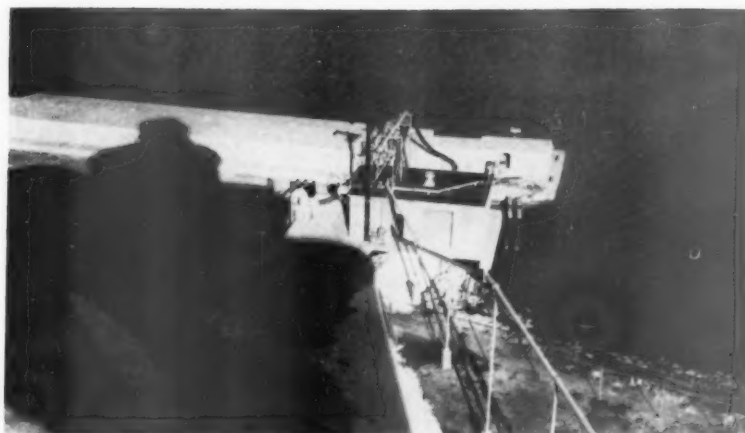
The cement is drawn from the stor-



Unloading and elevating conveyor used to handle paper bags from car to storage on second floor of packhouse



General plan of cement terminal



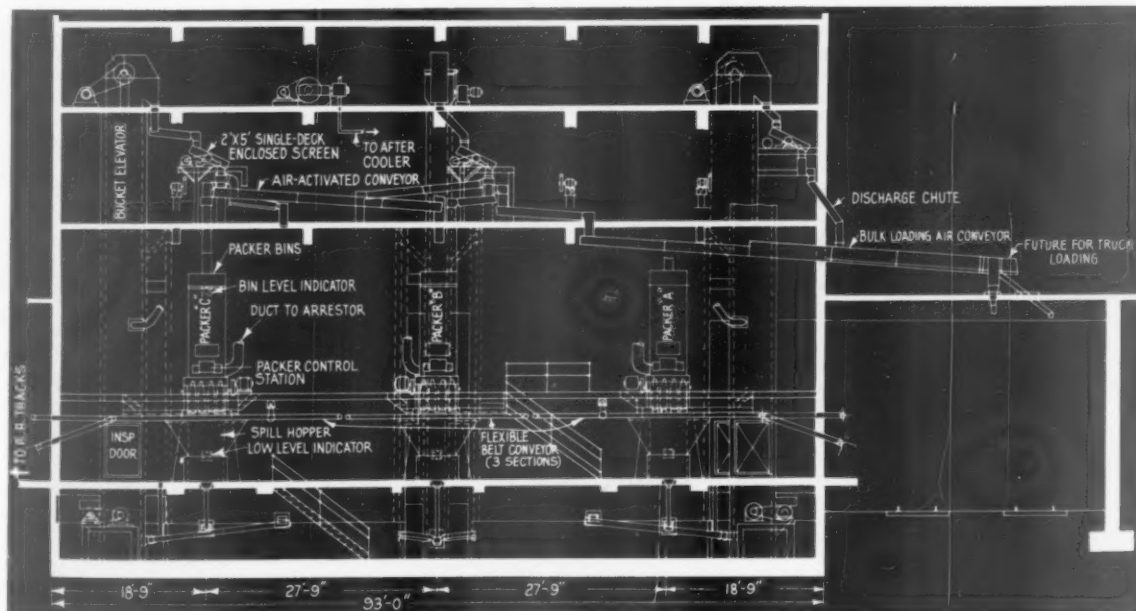
Self-unloading barge moored at unloading station



Headframe of elevating conveyor that moves incoming paper bags to second floor of packhouse

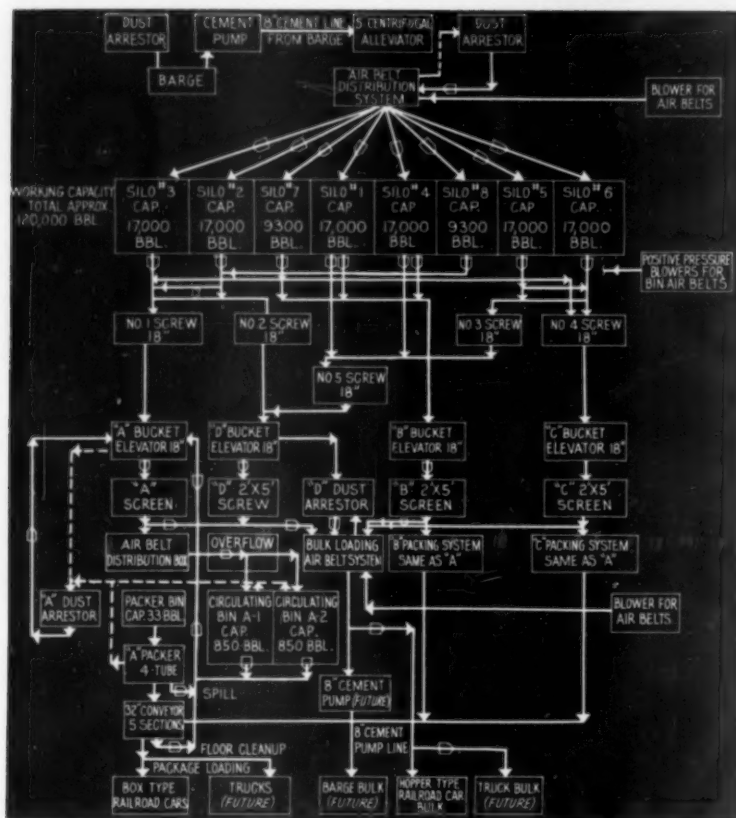


Four-tube packer with sliding operator's seat and central control station for packing operations



General arrangement of packhouse

CEMENT



Flowsheet of New Orleans terminal operation

age silos to 18-in. screw conveyors which run parallel and adjacent to the silos. By means of cross conveyors the cement may be delivered to any one of four 18-in. bucket elevators, three of which supply cement to the packing machines with the fourth serving the bulk loading facilities. Each elevator discharges onto a 2-x-5-ft. Selectro single-deck scalping screen to remove any tramp material. Then the cement is distributed to the

packer surge bins or recirculation bins as required. There are six recirculation bins, each having a capacity of 850 bbl. These, as well as the packer surge bins, are equipped with automatic Bin-Dicators.

Three type 107-FC St. Regis four-tube packers are used. Each operator has a sliding seat to permit him to move from one tube to another more easily. The packing machines are equipped with spill hoppers from

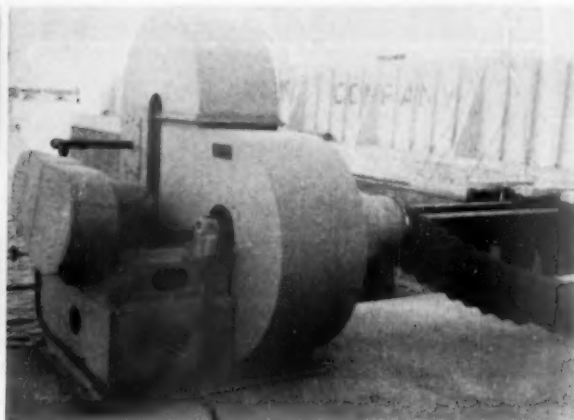
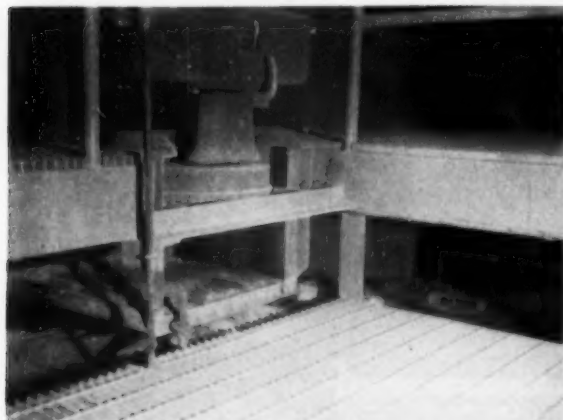
which the cement is returned to the 18-in. bucket elevators. Also, each system has a Norblo automatic bag-type dust arrestor with dust suction pipes to the elevators, recirculation bins and packers, the dust being returned to the elevators. All equipment controls for each packer are located on the machine for easy access to the operator. The packing rate is about 300 bbl. (1200 sacks) per hour per packer.

The sacks from the packers drop onto a 32-in. wide Flexoveyor conveyor system consisting of five sections, each driven by a 1-hp. motor and each operating independently in either direction. A Flexoveyor section consists of a series of endless spring belts running over grooved rolls. This conveyor system runs underneath the packers to either side of the packhouse and one or two cars can be loaded simultaneously. A 200-lb. capacity Fairbanks-Morse scale is provided at the end of each conveyor to check sack weights. When checking the weight of a sack one section of the Flexoveyor is raised by means of a hydraulic ram so that the sack is carried to a weighing basket. After weighing, the sack is pushed off onto the Flexoveyor beneath.

There are two railroad sidings, one on each side of the storage silos and packhouse. Each siding has two tracks and 32 cars can be accommodated. Either siding can be used for packaged cement and one track, which is equipped with a 50-ft. long 300,000 lb. capacity Fairbanks-Morse track scale, is used for bulk loading. Two 10-hp. Stephens-Adamson car pullers and a 20-ton Whitcomb diesel locomotive are used to handle cars. The sidings are connected to the New Orleans Public Belt railroad.

Empty sacks are received in box cars and are handled and elevated to the second floor storage area by a Flexoveyor bag unloader. This conveyor is similar to that used for handling packaged cement but consists of two

(Continued on page 157)



Left: Scale for check weighing of sacked cement. Air operated hoist raises conveyor so bag of cement goes into weigh basket with no manual effort on the part of the operator. Right: Fan and hose to barge for dust collection at unloading station

Aggregates

Gravel plant features extensive use of conveyors and hindered settling classifier for fine sand recovery

By RAY BLOOMBERG



Screening plant at the aggregate operation for Chief Joseph dam on the Columbia river near Bridgeport, Wash.

Aggregates for Chief Joseph Dam

THE AGGREGATE PLANT for the construction of the \$221,000,000 Chief Joseph dam on the Columbia river in north central Washington state is noteworthy for the exclusive use of belt conveyors rather than trucks, as usually is the case on a construction project, and a novel classifying tank for the gradation of minus No. 16 size sand.

On most construction jobs, trucks have been thought to be more economical than conveyor systems, with their heavy initial cost. The Chief Joseph aggregate plant closely resembles a commercial operation, however, since the dam's 1,700,000 cu. yd. of concrete will require the crushing and screening of 3,000,000 tons of aggregate during the next five years. The entire system was designed and installed by the Conveyor Co., Inc., Los Angeles, Calif., for the Chief Joseph Builders, contractor to the Corps of Engineers.

Aggregates are produced at a pit $3\frac{1}{4}$ miles from the concrete batching plant, which began operation in September. A Bucyrus-Erie 120-B electric shovel with a 6-cu. yd. bucket has excavated to a depth of about 50 ft., working a relatively high bank in order to maintain a good ratio of sand and stone. It dumps into a 42-in. x 8-ft. circular double action reciprocating Conveyco feeder capable of handling 1000 t.p.h. A 120-ft. pendulum conveyor leads to a 30- x 42-in. Pioneer primary crusher in a crusher car operating on railroad tracks. The crusher is set to make a maximum of 6- to 3-in. material, nothing larger than 8 in.

This same procedure might be followed in the aggregate plant of any construction project, although trucks

often take the material directly from the shovel to the primary crusher outside the quarry. Even where a conveyor is used to the primary crusher, however, trucks usually have been employed to take the material out of the quarry to the secondary crusher. At Chief Joseph, movement from the primary to the secondary crusher is by conveyor.

The conveyed material discharges into the 32- x 42-in. Lippmann secondary crusher, with a Stephens-Adamson feeder, and goes to two Allis-Chalmers scalping screens, and from there to a minus 6-in. surge pile having 9400 tons of live storage.

From the surge pile, the material is conveyed to the top of the screening plant. Here plus 3-in. minus 6-in. and plus $1\frac{1}{2}$ -in. minus 3-in. material is washed and screened through two 4- x 12-ft. double-deck screens with

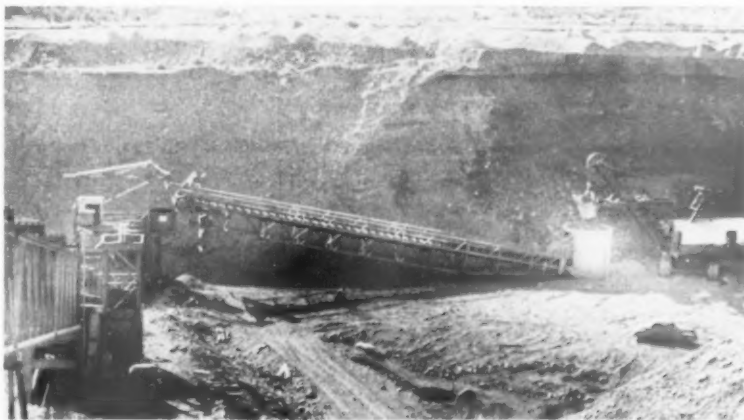
$3\frac{1}{4}$ -in. square openings in the top deck and $1\frac{1}{2}$ -in. square openings in the bottom.

The minus $1\frac{1}{2}$ -in. material, with the wash water, passes to 5- x 14-ft. double-deck screens having $\frac{7}{8}$ -in. square openings in the top deck and $3\frac{1}{2}$ -in. mesh (0.08 wire, 0.206 openings) in the bottom deck. Plus $\frac{3}{4}$ -in. minus $1\frac{1}{2}$ -in. and minus $\frac{3}{4}$ -in. stone is finished through these screens.

Undersize from these screens goes to 5- x 14-ft. double-deck screens having 8-mesh and 16-mesh openings. Excess of coarse sand requirements is conveyed to a rod mill surge pile.

The sand circuit produces two sizes, plus No. 16 minus No. 4 and minus No. 16. Control of percentage of No. 4 to No. 8 and No. 8 to No. 16 is through controllable splitting chutes.

Gradation of minus No. 16 size into eight fractions is controlled through



Looking down into the excavation, with a 6-cu. yd. electric shovel (right) delivering to the feed hopper



Aggregate stockpiles at the plant; the material is delivered to the batching plant at the dam site by 20-cu. yd. trucks

an unusual classifying tank with four longitudinal compartments, each of which is subdivided into eight sections. Each of these eight sub-compartments is fitted with two valves, controlled by a rod extending above the tank, to permit saving or wasting the product. The vertical weirs between the subcompartments are of decreasing heights to control the settling rate at a given velocity through the tank. An overflow lip 25 ft. long at the discharge end of the tank slows up the water, making possible a saving in the desired fines in the No. 100 to No. 200 size range.

The sand to be dewatered passes directly to a Conveyco dewatering wheel, where about 20 percent of the moisture is taken out. Coarse and fine sand is conveyed from drained stockpiles to two steel bins under which are located Feedweights for blending.

Although belt conveyor systems are used exclusively within the aggregate plant, materials are taken to the batching plant by four 20-cu. yd. trucks operating around the clock at peak periods. Before being added to the mix, the aggregates are cooled from a maximum of 85 deg. to a maximum of 42 deg. by a continuous blast of refrigerated air during the 90 min. or more they are in the batching plant storage bins. Sand can be cooled from 75 deg. to 50 deg. at the rate of 65 t.p.h. by two hollow-flight screw conveyors operating in parallel.

As a result of this cooling of the aggregate, concrete is being placed with temperatures as low as 40 deg. F., the lowest temperature as yet specified on a large project. Since the concrete mix is unusually lean, control of aggregates in the mix is very tight, with special attention paid to close tolerance of fines and sand in the batch. Fines are removed from the air used to cool the aggregates, and are returned to the batching plant in the mix water.

For concrete in the interior of the dam, a 4-cu. yd. batch is made up

of 3780 lb. of sand, 1260 lb. fine aggregate, 940 lb. cement, 1 lb. 8 oz. admixture, 3740 lb. coarse aggregate, 300 lb. water, 2960 lb. medium aggregate, 4060 lb. cobbles and 300 lb. of ice.

For exterior concrete, a batch is composed of 3740 lb. sand, 1180 lb. fine aggregate, 1504 lb. cement, 10 oz. admixture, 3420 lb. coarse aggregate, 240 lb. water, 2820 lb. medium aggregate, 3860 lb. cobbles and 300 lb. of ice. Tolerances of only 2 percent are allowed on the $\frac{3}{4}$ - and $1\frac{1}{2}$ -in. sizes, 3 percent on 3- and 6-in. sizes.

Gypsum Association Report

THE GYPSUM ASSOCIATION, in a "state of the industry report," as presented by Lloyd H. Yeager, general manager, revealed that the production of gypsum lath and board products reached record high levels in 1951. An estimated 6.25 billion sq. ft. of gypsum lath and board were produced, which is an 8 percent increase over the previous record output in 1950. Mr. Yeager predicted that production and sales in 1952 will also hold to a high level and he bases this prediction on an ever increasing demand for gypsum building materials, modernized building codes which accept new building materials and systems on a performance basis, and wider use of recently introduced construction systems based on gypsum products.

Mr. Yeager reported that new fireproofing construction for light steel structural frame will soon be presented to the building industry. The new fireproofing combines the high fire-resistant qualities of gypsum lath and lightweight aggregate plasters.

According to the report, if light steel, fireproofed with gypsum, is used in preference to heavier steel, fire-protected with concrete, thousands of dollars and tons of steel can be saved in the requirements for structural

frames for commercial, apartment and other buildings. The light steel-gypsum construction is also claimed to be more economical than reinforced concrete frame. Fire tests conducted at the National Bureau of Standards gave fire-resistant ratings up to 4 hr. for gypsum lath and lightweight plaster fireproofing over steel beams and columns.

The Gypsum Association commissioned nationally known architects to design a hypothetical 12-story building for the purpose of making cost comparisons. Findings indicated that the heavier steel frame protected by concrete costs \$50.63 per sq. ft. of building area, 12 stories high, which includes the cost of footings, steel frame and concrete floors, and fireproofing with bond plaster on the ceiling, beams and columns; if the bond plaster is eliminated and the concrete is vibrated, the cost was found to be \$46.16 per sq. ft.; the reinforced concrete frame for the 12-story structure would cost \$36.71 per sq. ft.; and the light steel frame, fireproofed with gypsum construction would cost \$31.29 per sq. ft. Mr. Yeager pointed out that all factors for structural strength, fire endurance and utility were similar in all three designs.

Gypsum lath is also expected to be more in demand with the anticipated increased use of studless 2-in. solid gypsum partitions, which are constructed of $\frac{1}{2}$ -in. gypsum lath, plastered to a $\frac{3}{4}$ -in. thickness on each side.

Gypsum sheathing is expected to be in greater production as a result of the recent F.H.A. ruling which permits its use without building paper.

The use of gypsum wallboard in home construction is also increasing. The National Association of Home Builders estimates that gypsum wallboard is used for interior walls in 48 percent of the homes now being built. The cutback in new home starts in 1951, which gave impetus to remodeling work, has added to the increased demand for gypsum wallboard. Another factor is the growing popularity of the gypsum two-ply or double wallboard system which is being installed in higher-priced homes.

In conclusion, Mr. Yeager stated that Department of Commerce figures show that gypsum lath and board production has increased more than 400 percent since 1939, while the production of all other basic building materials has increased 85 percent in the same period.

Dam Contract

DRAVO CORP., Pittsburgh, Penn., was recently awarded a \$3,086,414 contract by the Army Corps of Engineers, Nashville, Tenn., district, for construction of Cheatham dam on the Cumberland river near Ashland, Tenn. Concrete aggregates will be supplied by Lambert Brothers, Inc., Knoxville, Tenn.

THERMODYNAMICS OF LIME MANUFACTURE

Part VI. Balancing economic factors in the determination of optimum size of rotary kilns

By RALPH GIBBS*

TOO FREQUENTLY the selection of the rotary kiln for a specific installation is settled entirely by the kiln manufacturer or his representative. The purchaser often is in the position of the man who goes into the hat store to buy a hat and has forgotten his size, and has only a vague idea of the style he wants.

Before any purchaser puts his good money into a rotary kiln, he should know definitely what he wants this kiln to do (a) in the way of production, (b) in the way of fuel economy, and (c) in the way of maintenance charges. There is no good excuse for any purchaser of a rotary kiln to buy this expensive article blindly. If he doesn't know exactly what he wants, or if his personnel doesn't know what his requirements are, he should call in for consultation and advice an independent consultant or advisor who does know, or who can determine from the specific conditions of the proposed operation what the best size of the kiln will be, what fuel economy can be anticipated, and what structural features must be incorporated in the unit to keep maintenance to a minimum.

Know the Production Rate

It is to your advantage to know what production rate you want from your new kiln unit. Set a definite figure. Try to anticipate your future requirements, but don't buy a kiln of a capacity in excess of your needs for the next three years. A rotary kiln operates at its highest efficiency when its production rate is within 10 percent, plus or minus, of its nominal capacity. When you attempt to operate the kiln at capacities too far below, or too high above, its nominal capacity, you will pay through the nose either for fuel or for maintenance.

So, no matter how you arrive at your figure, set a definite production rate for your kiln.

What Size Kiln?

With an optimum production rate established, it is important to you to

know what size the kiln should be to produce this tonnage. Each kiln manufacturer will propose a size which it *believes* will suit your requirements. Actually, the manufacturer is often not in a position to know. You are the only one in a position to know this, since you are the only one who knows the economics of your own operation. You know the cost of the fuel you propose to use with the kiln. You know, or should know, the rate at which you want to amortize the investment with, of course, the approval of Uncle Sam. You know better than anyone else the interest charges that are to be incurred by making the investment.

Your specific economic conditions will determine the size of the kiln needed.

The Economic Balance

Your kiln will be economically balanced when the cost of extracting the heat from the gases is equal to the cost of the heat extracted. This is

best determined at the coolest end of the kiln, and basing the figures on a cost per hour per square foot of kiln shell surface equivalent.

If H_s is B.t.u./sq. ft./hr. transferred from the hot gases to the surface equivalent to the kiln shell surface, and F is a factor to convert H_s into cents/sq. ft./hr., in terms of the cost of fuel, then

$H_s F$ = cash value of the heat transferred per square foot per hour.

If C_s is the cash cost of providing and maintaining each square foot of surface per hour, the economic balance will be attained when:

$$H_s F = C_s$$

In other words, the fuel value of the heat extracted is equal to the cost of providing and maintaining the surface for the transfer of the heat. These three elements of the economic balance can be related as shown in Fig. 1.

F has a value that depends upon the unit fuel cost and the heating value per unit. Thus

$$F = \frac{\text{Unit cost of fuel}}{\text{Heating value per unit}} = \text{cents per B.t.u.}$$

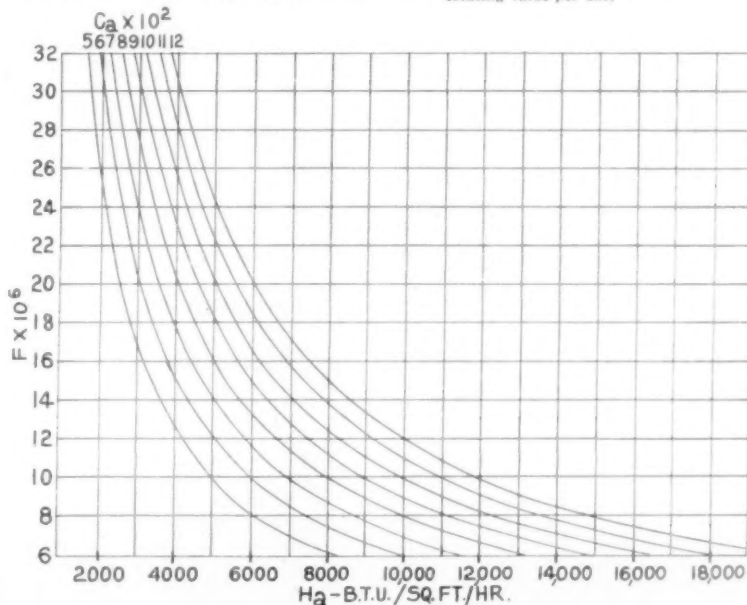
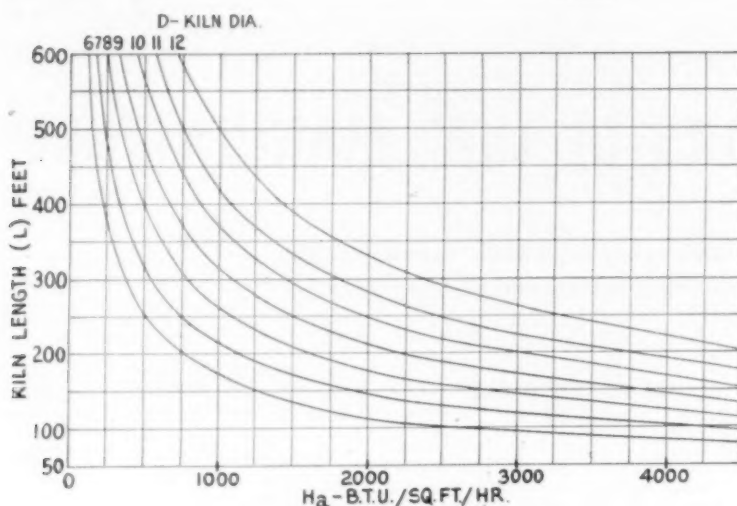


Fig. 1: Relation of fuel value of heat extracted to costs

*Consulting engineer, York, Penn. (deceased). This article is the sixth in a series on the thermodynamics of lime manufacture, published in *Rock Products*: February, 1950, page 118; June, 1950, page 122; October, 1950, page 110; February, 1951, page 108; May, 1952, page 92.

Fig. 2: Relation between H_a and kiln dimensions

For coal bearing a cost of \$7.50 per ton, and having a heating value of 13,500 B.t.u./lb.,

$$F = \frac{750 \text{ cents}}{13,500 \times 2000} = 0.0000278 \text{ cents/B.t.u.}$$

For Bunker C or No. 6 oil at a cost of 6 cents per gal. and having a heating value of 147,000 B.t.u./gal., then

$$F = \frac{6 \text{ cents}}{147,000} = 0.000041 \text{ cents/B.t.u.}$$

For gas at 5 cents/Therm,

$$F = \frac{5}{100,000} = 0.000050$$

C_a is the cost per hour of providing and maintaining a square foot equivalent to that of the kiln shell. It is over this item that the accountants and professional economists can battle to their heart's content. But we can ignore these tempests in a teapot. You can devise your own system for evaluating C_a .

Simply as a suggestion, the author presents the following as one method for evaluating C_a .

$$C_a = C_1 + C_2 + C_3 + C_4 + C_5$$

Where C_1 is the amortization charge per hour for each square foot of kiln shell surface.

C_2 is the interest charge per hour for each square foot of kiln shell surface.

C_3 is the brick lining charge per hour for each square foot of kiln shell surface for the coolest end of the kiln.

C_4 is the maintenance charge per hour for each square foot of kiln shell surface.

C_5 is the endurance and miscellaneous charge per hour for each square foot of kiln shell surface.

Simply to illustrate this method for evaluating C_a , let it be assumed that an 8- x 135-ft. kiln is our subject. It

costs, installed, \$100,000 and is to be amortized in ten years. The interest charges are 5 percent per annum. The brick lining in the coolest zone has a cost of \$2 per sq. ft. of kiln shell surface and is replaced every five years. Maintenance charges are 1 percent per annum. Insurance and miscellaneous charges are at an annual rate of 5 percent. About 3390 sq. ft. of kiln shell surface are involved. And there are 8760 hr. per year. Thus

$$C_1 = \frac{\$100,000}{10 \times 3390 \times 8760} = .0336 \text{ cents/sq. ft./hr.}$$

$$C_2 = \frac{.05 \times \$100,000}{3390 \times 8760} = .0168 \text{ cents/sq. ft./hr.}$$

$$C_3 = \frac{\$2}{5 \times 8760} = .0046 \text{ cents/sq. ft./hr.}$$

$$C_4 = \frac{.01 \times \$100,000}{3390 \times 8760} = .0034 \text{ cents/sq. ft./hr.}$$

$$C_5 = \frac{.05 \times \$100,000}{3390 \times 8760} = .0168 \text{ cents/sq. ft./hr.}$$

$$C_a = .0752 \text{ cents/sq. ft./hr.}$$

From these economic conditions assumed for our illustrative example, it is seen that

$$H_a = \frac{C_a}{F} = \frac{0.0752 \text{ cents/sq. ft./hr.}}{0.0000278 \text{ cents/B.t.u.}} = 2700 \text{ B.t.u./sq. ft./hr.}$$

when using coal at \$7.50 per ton.

When using fuel oil at 6 cents per gal., then

$$H_a = \frac{0.0752 \text{ cents/sq. ft./hr.}}{0.000041} = 1840 \text{ B.t.u./sq. ft./hr.}$$

This means that under the conditions of our example, the economic length of the kiln, when using coal, must be such that the last hot combustion gases in the kiln will deliver its heat at a rate of 2700 B.t.u./sq. ft./hr. With oil, the economic length of the kiln must be such that the last hot combustion gases in the kiln will deliver heat at a rate of 1840 B.t.u./sq. ft./hr.

By computing the values of F and C_a for your own specific conditions, you can determine the value of H_a that must prevail in order that your kiln will be economically proportioned.

Although this determination of the economical value of H_a is necessary for the ultimate selection of the proper diameter and length of your kiln, it is imperative to have some form of a relation between the value of H_a and the physical dimensions of the kiln.

The author has developed such a relation, which is as follows:

$$H_a = \frac{.043D^2 (4700 + 1550D) (572 + .56L) (2L - 10)}{L^2 (L - 10)}$$

This relation is shown graphically in Fig. 2. The values of H_a can be determined for rotary kilns of different lengths and diameters.

From Fig. 1 we can determine the economic value of H_a . From Fig. 2 we can determine the economical proportions of kilns for specific values of H_a . Now we have further need for a relation that will guide us in selecting an economical kiln size for a specific production rate. For this we must resort to our production-rate relation

$$T_a = \frac{k D^2 L}{100}$$

where T_a is the tons of material produced per day.

D is the kiln shell diameter, in feet.

L is the kiln shell length, in feet.

k is the production coefficient that has a value depending upon the kind of material under process and other circumstances attending the operation of the kiln.

The value of k will be about 1.0 when

(a) Lime-burning with dry feed, and without recovering heat from the discharged lime;

(b) Burning dead-burned dolomite, recovering heat from the discharged product.

The value of k will be about 1.5 when

(a) Lime-burning with dry feed, and recovering heat from the discharged lime.

The value of k will be about 1.9 when*

(a) Burning cement clinker, either wet or dry feed, and recovering heat from the discharged clinker.

This relation and the graph of Fig. 2 can be combined as shown in Fig. 3.

Fig. 3 can be used to determine the most economical size of rotary kiln for a specific production rate and under various economic conditions for cases where the value of k will be 1.0. As an example to illustrate the use of this graph, let us assume that F is 27.8×10^{-6} and that C_a is 8.0×10^{-3} .

*Griswold, John. "Fuels, Combustion, and Furnaces," page 422, McGraw-Hill, 1946.

LIME

From the graph of Fig. 1 it is determined that H_a must be 2880. The assumed kiln is to produce 250 tons per day of dead-burned dolomite, recovering heat from the discharged product. From Fig. 3 it is seen that under these conditions the most economical kiln will be 9 ft. 6 in. x 190 ft.

If fuel oil is to be used at 6 cents per gal., then F will be 41×10^{-6} , and if C_a remains at 8.0×10^{-6} , then H_a must be 1950. Under these conditions, it is seen that the most economical kiln will be about 8 ft. 9 in. x 212 ft.

Graphs similar to that of Fig. 3 can be devised for different k values.

Because of the different thermodynamic features of the wet-feed kiln, these graphs presented here are not applicable. Such graphs have been developed by the author, however. From these graphs, it is possible for anyone to select the proper kiln size for any practical daily output, and for any common economic conditions.

What Fuel Consumption?

In the light of the foregoing, the striving for an extremely low fuel ratio may be penny-wise and pound-foolish. It may prove to be a chase after a will-o'-the-wisp. It may be costing more to have a low fuel ratio than it is actually worth.

By selecting the size of the kiln on an economic basis, the fuel ratio will be that which is most economical. Whether it is high or low has little meaning economically. It will be high or low only by comparison with some other installation where the economic factors will be quite different. With low-cost fuels and high-cost kilns, it is obviously ridiculous to provide and maintain more heat-exchange surface than the cost of the fuel justifies. On the other hand, with high-cost fuels and low-cost kilns, it is important to get the maximum economy out of the fuel.

By choosing the proper size of kiln with the help of economic principles, the fuel ratio will be the most economical for the specific conditions under which you are operating.

Evaluating Kiln Choices

As a prospect for a rotary kiln purchase, you may find yourself in a dilemma if you haven't established to your own satisfaction the size of kiln needed.

If you are wise, you will have determined for yourself the kiln size that will best meet your needs under your specific economic conditions. You will eliminate considerable confusion at the outset by having all proposals based upon a single kiln size.

With these proposals and specifications for a definitely sized kiln before you, it is well to review and tabulate in table form the specifications of each proposal before you are influenced too much by the quoted price. Only when you have a true basis for comparison

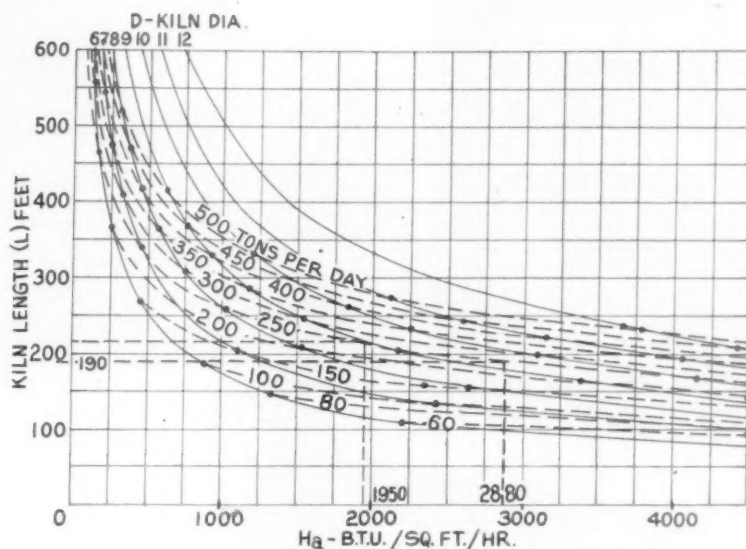


Fig. 3: Graph for determining most economical size of rotary kiln for specific production rates and under various economic conditions for cases where $k=1$

does the price have any meaning whatsoever.

From the tabulation compare the construction of the kiln shells; the number, size, and kind of riding rings; the kind, size, and arrangement of the rollers; size of bearings, and kind; lubrication features, and look for ample bearing surfaces and adequate lubrication. Look also to the kiln drive; the horsepower required; the motor; the speed reducer; the drive pinion and pedestal arrangements; the ring gear; its construction and method of attachment to the kiln.

Tabulate every possible item connected with the kiln and its auxiliaries. Then make your comparison between the proposals. By a process of elimination it is usually possible to reduce the number of possibilities to one or two manufacturers. Get your engineer and your master-mechanic to go over the tabulation. They will spot any mechanical discrepancies or irregularities.

You can be assured of getting what you need for the best price when you go about selecting your kiln on a sound basis.

Aids in Flood Crisis

TWO IOWA LIMESTONE PRODUCERS, Missouri Valley Limestone Co., Inc., Macedonia, and the L. R. Falk Co., Saint Ansgar, donated their services, equipment and materials during the recent flood crisis at Council Bluffs. Missouri Valley Limestone Co. operated its plant at capacity, 24 hr. per day for five days and, with a fleet of 56 trucks, crushed and hauled rock to the stricken area. L. R. Falk from Saint Ansgar was also there with a fleet of trucks to haul sand bags, with Mr. Falk driving one of the trucks himself.

Safety Book Reviewed

Handbook of Dangerous Materials, by N. Irving Sax, 850 pages, Reinhold Publishing Corp., 330 W. 42nd St., New York, N.Y. \$15.

HERE IN ONE volume is the safety engineer's best helper. The author, toxicologist for General Electric Co., Schenectady, N.Y., has compiled safety facts and listed hazardous properties of 5000 materials found in industry, all arranged alphabetically, cross-referenced and indexed.

The largest section is devoted to flammable, poisonous and corrosive chemicals, giving such data as treatment and antidotes, extinguishers, storage and handling, protection equipment and other necessary information. Though this would probably be of much assistance only to those industries using a variety of chemicals (though any plant using fluorescent lights would find hazards listed in this section, for instance), the explosives section makes the volume of considerable value. Storage of explosives, destruction of explosives and descriptions of the types of explosives, with recommended handling methods, is some of the heretofore scattered information brought together in this one section. Another section includes complete I.C.C. shipping regulations as issued by the Bureau of Explosives. If the safety man is still interested, he can find two more major sections in the handbook, one on fungus diseases and fungicides, the other on radiation and radiation hazards. These two sections contain descriptive introductions, providing for a background in subjects ordinarily missing in most safety engineer's experience.

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N.L.A. CELEBRATES GOLDEN ANNIVERSARY

Fiftieth annual meeting reviews progress of industry and National Lime Association. Program also included safety, government regulations, percentage depletion, use of lime in blast furnaces, neutralization of lakes and ponds, and research

FIFTY YEARS AGO, the National Lime Association had its start at an organizational meeting held in Cincinnati, Ohio, which was commemorated by a Golden Jubilee program held this past May 8-10 at Hot Springs, Va. The 50th annual convention was the National Lime Association's largest annual meeting, to pay tribute to the founding of the organization and to the living old-timers who were there at the beginning or who contributed to its continuous development through the early years. The official registration was 151, including 56 ladies and veterans of the industry who came especially to participate in the celebration.

A special Golden Jubilee program was printed in honor of the occasion which gave a complete presentation of the history of lime, the start of the association and the high points in its growth, a resumé of accomplishments of the industry and the association and much information on current developments and activities. This handsome booklet lists members, shows the location of their plants, the names of officers and directors and traces the history of lime from about 4000 B.C. to the present time. It tells how Edgar H. Defebaugh, first editor of *ROCK PRODUCTS*, called a meeting in November, 1902, to discuss formation of a national lime association, and how a constitution and by-laws were drafted for establishment of a permanent national organization. Charles Warner, now chairman of the board of directors of Warner Co., Philadelphia, Penn., was temporary chairman of that meeting and he was present at the 50th annual convention as the only living charter member of the original organization. Mr. Defebaugh was temporary secretary of the first meeting and both men were on the first slate of permanent officers. At the meeting held January 19, 1903, in Indianapolis, Ind., *ROCK PRODUCTS* was selected as the official association organ.

At that time there were about 1000 lime plants as contrasted to the 118 of commercial significance which the N.L.A. estimates as being in operation today. Norman G. Hough was appointed as the first paid staff officer, of the then Hydrated Lime Bureau, in 1914. In 1918, N.L.A. superseded the National Lime Manufacturers Association and the Hydrated

Lime Bureau, and a budget was provided to finance the needed promotional and educational work. S. Walter Stauffer became the executive officer for 10 years starting in 1936 after Mr. Hough's resignation, to be followed in 1946 by Robert S. Boynton who is present managing director.

The program points out the trends in the lime industry over the years and particularly the reversal in the principal uses for lime. In 1907, 70 percent of all sales was for building use whereas, today, 80 percent of all lime is now chemical and refractory lime. The modern flowsheet for lime manufacture is shown, graphical trends in numbers of plants and increased demands, graphical trends in lime shipments by markets over the years, the multiple uses of chemical

blast furnaces, the neutralization of ponds and lakes, and research.

Officers

Wallace E. Wing, president, Marblehead Lime Co., Chicago, Ill., was re-elected to a fourth term as president and chairman of the board of directors; Robert S. Boynton was re-elected general manager and Gladys L. McBee, secretary. Paul Sunderland, Ash Grove Lime and Portland Cement Co., Kansas City, Mo., was elected treasurer. The board of directors is unchanged with one exception, that being T. R. Ellerbeck, Utah Lime and Stone Co., Salt Lake City, Utah, who succeeds Ralph S. Locke for District 15 (western). The executive committee comprises Wallace E. Wing, Reed C. Bye, Bolton Corson,



The cast in action, presenting the playlet depicting the first lime meeting of 50 years ago. Members of this hirsute group are, left to right, John H. Gruber, Franklin Witmer, David Shroyer, Kent Jander and J. S. Offutt

lime, and the current activities of the association are summarized in the brochure.

The souvenir program was printed in quantity for distribution to those interested and would make a valuable booklet for anyone identified with the subject of lime.

Program

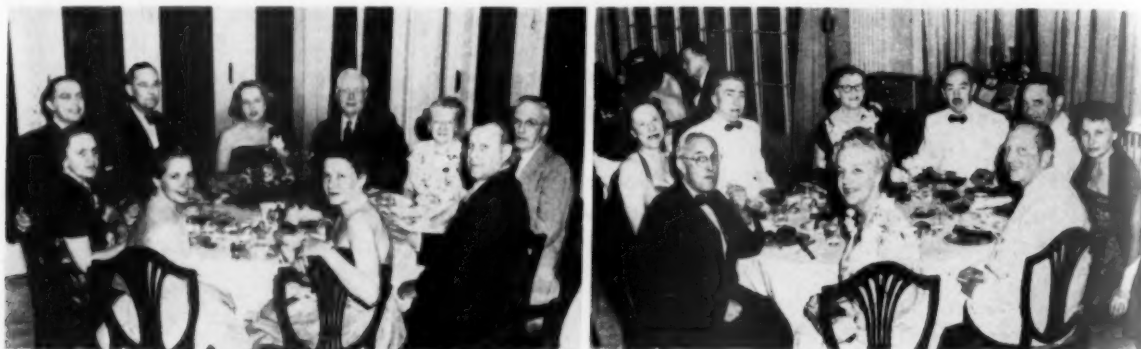
The convention program departed somewhat from conventional practice to permit special presentations in commemoration of the anniversary, but the usual business session and coverage of subjects important to the industry were included in the three-day program. Among topics covered were safety, government regulations, percentage depletion, use of lime in

Ralph Dickey, C. C. Loomis, K. L. Hammond and Amos B. Miner.

Business

The association is enjoying its healthiest condition in history from all standpoints. In membership, it represents more than 75 percent of total national lime production and there has been a 25 percent increase in members since World War II. Financially, it has a substantial reserve and has adopted a considerably increased budget to finance its percentage depletion program. More than one-third of the total budget is to finance research and promotion.

Appropriate resolutions were passed in the deaths of Henry Huschke, Norman Hough and John Maginnis.



Left: Left to right are Mrs. J. W. Rockwood, Mr. & Mrs. A. E. Pavlish, John Andrews, Janet Mack, A. B. Mack, Mr. & Mrs. W. Bell, J. W. Rockwood and Mrs. John Andrews (front right), all of Kelley Island Lime & Transport Co. Right: From front (l. to r.) are Mr. & Mrs. John C. Best, National Gypsum Co., Buffalo, N.Y.; Mr. & Mrs. J. S. Offutt, U.S. Gypsum Co., Chicago, Ill.; Mrs. Amos B. Miner; H. D. Brigstocke, Thomasville Stone & Lime Co., Thomasville, Penn.; Amos B. Miner, National Gypsum Co., Buffalo, N.Y.; Mrs. H. D. Brigstocke; and E. I. Williams, Riverton Lime & Stone Co., Inc., Riverton, Va.

Mr. Huschke served at one time as agronomist for the association, in recent years was managing director of the Agricultural Limestone Institute and at the time of his death served the interests of the industry with O.P.S. Mr. Hough was one of the driving forces in the early years of the association, as its first paid executive officer, and Mr. Maginnis was president of Eagle Rock Lime Co., Eagle Rock, Va.

President Wallace E. Wing, in calling the convention to order, stressed the important part that a strong trade association has in promoting the welfare of the industry and in establishing influence with government agencies which reflects to the benefit of producers. Through its Washington staff, the association has acquainted government with the industry and its problems, with effective results. Mr. Wing expressed his pleasure that industry effort was instrumental toward securing 15 percent percentage depletion benefits (for chemical and metallurgical grade stone) and he expressed the indebtedness of the industry to the members of the percentage depletion committee. He cautioned that this benefit must be protected from attack by constant vigilance.

General Manager's Report

A summary of the principal accomplishments and activities of his office was given by Robert S. Boynton in his annual report. He expressed the opinion that the world situation was more favorable than a year ago and he was optimistic that the demand for lime would continue strong. With all emphasis on plant expansion throughout industry during recent years, he said that it is fortunate that the lime industry did not over-expand its productive capacity.

Whereas much of the work of any association is hard to evaluate because of the intangible nature of much of its activities, he pointed to the granting of percentage depletion

benefits to the industry as one outstanding accomplishment directly traceable to four years of effort by the association. The benefits resulting amount to 20 cents per ton for limestone or 40 cents for lime, in the reduction of net earnings before taxes. This exemption will be attacked and the association is pledged to a program to protect it in the years ahead. Mr. Boynton thanked the individual members who worked hard to secure the benefits.

During the past year, the association has been active in its promotion work. Two new publications, "Chemical Lime Facts" and "100 Questions and Answers on Liming Land," were put out and publicized, resulting in a great number of inquiries from chemists and chemical engineers in lime-consuming industries.

Mr. Boynton then discussed the various research activities with the exception of the fundamental research program at M.I.T. which was to be covered by Prof. James Murray in the concluding session. Research in the treatment of trade wastes is being conducted under fellowships at Purdue and Rutgers Universities. At Purdue, the emphasis is on treatment of petroleum and vegetable wastes and, at Rutgers, research is being continued on acid wastes. A great deal of information is being developed and disseminated as a result. The market for lime in the treatment of trade wastes may develop to exceed that for water treatment.

Studies on lime soil stabilization are being continued at Purdue. Among new developments in this field mentioned was the use of lime with fly ash as pioneered by G. & W. H. Corson, Inc., which indicates favorable results. A trial lime-stabilized road is being built at Beaumont, Texas, using pulverized quicklime. Durability tests on lime-soil stabilization are being continued at Purdue University. Research on the use of lime with pozzolanic materials in the manufacture of concrete products is being carried forward at Toledo Uni-

versity. The injection of lime through tuyeres into blast furnaces, which will soon be given a full-scale trial run at the U. S. Steel Co. plant at Clairton, Penn., was mentioned as an application that might increase the markets for lime.

New market studies were begun during 1951, and publication of "Lime Abstracts" is one example of technical information to be disseminated on a regular basis. Another effort was a geographical census of water treatment plants using lime. The Golden Jubilee souvenir program will be given wide distribution as a promotional piece. Mr. Boynton touched briefly on the annual operating sessions. The 1951 meeting at Stockbridge, Mass., was the largest in history. The 1952 fall meeting will be held at Mountain Lake hotel, Kimballton, Va., to permit operating men to visit operations in that area.

Special Events

Following Mr. Boynton's presentation, Mr. Wing listed the names of old-timers present and then called upon Charles Warner, the only living charter member and three times past chairman of the association, to reminisce on the early days of the association. He paid high tribute to the dynamic force which Edgar Defebaugh put behind the early organization and recounted some of the trying experiences of the early days, mainly financial.

As part of this scheduled "Salute to the Past" George Wood and Nathan C. Rockwood, consulting editor of ROCK PRODUCTS, were on the program for comments. Mr. Wood was unable to be present for reasons of health but Mr. Rockwood, who has been closely identified with the industry for many years, made some brief comments. Mr. Rockwood said that he was fortunate to have succeeded Mr. Defebaugh as editor of ROCK PRODUCTS and to have had the opportunity to learn the lime industry from lime manufacturers who were quick to cooperate and contribute the

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Left to right are Mrs. R. F. Matthews; John S. Schirm, Grand Canyon Lime Co., Los Angeles, Calif.; Mr. & Mrs. Victor R. Koenig, Mississippi Lime Co., Alton, Ill.; Bob Boynton, general manager, National Lime Association, Washington, D.C.; Burton Ford, St. Regis Paper Co., Allentown, Penn.; Mrs. Robert S. Boynton and R. F. Matthews, Mississippi Lime Co.



From front (l. to r.) are Irving Crown, Marblehead Lime Co., Chicago, Ill.; Mrs. J. M. Cooper; Wallace E. Wing, Marblehead Lime Co.; J. Milton Cooper, N.L.A. counsel; H. D. Wellington, International Paper Co., Chicago, Ill.; Mr. and Mrs. Lester Crown, Marblehead Lime Co.; R. L. Dickey, Kelley Island Lime & Transport Co., Cleveland, Ohio; and Mrs. W. E. Wing



Golden Jubilee banquet commemorating 50th anniversary of N.L.A.

benefits of their knowledge. In the early days, as he expressed it, lime manufacturers were chiefly concerned in gaining the attention and respect for the industry that was lacking in both public and scientific circles. The industry was composed of something over 1000 lime operations in 1902 and many of them were little kilns operated by farmers. Conditions were highly competitive and the favorite subject was how to make adequate profits.

Mr. Rockwood concluded by telling the purpose of the playlet, "Struggles of Infancy," to follow, which he had written especially for the occasion, and by expressing his debt to the National Lime Association and to many members, both present and gone, for a "great experience in living."

Purpose of the playlet was to remind the younger generation that there was a time when American types of rugged individualists existed, without the federal government cramping their style and to show how the old-timers reacted to the first signs of government intervention in their private business affairs.

The playlet proved extremely humorous and the actors, all members of the association, did an excellent job of playing the parts of the old-timers. They consisted of Alan B. Cheney, John Gruber, Franklin Witmer, David Shroyer, Kent Jander and Jim Offutt, each made up with whiskers, clothes of 1900 vintage and all the paraphernalia needed to portray the key individuals at a meeting 50 years ago. E. I. Williams was narrator and the

playlet consumed 30 minutes. The general theme of the meeting and argument was how the industry should organize and cooperate to make profits, and do it so as to avoid government intervention on charges of collusion. As it worked out, competitive economic conditions were left to determine the course of the industry, leading to cooperation among those who survived and later development of the National Lime Association of today.

The opening session concluded with a talk, "Your Time is My Business," by James W. Austin, vice-president, Capital Airlines. Mr. Austin presented figures to show the growth of air transportation which reached a billion dollars in 1951. However, only five of 160 million people are customers so far which means that there remains a big job to be done through merchandising and promotion. The airlines spent \$75 million to create that volume of business. In 1952, the airlines will offer the public 50 percent more seats than it did in 1950. The important role of advertising in building sales was emphasized. Of total passengers, a study has shown that 75 percent travel by air for business purposes as contrasted to only 25 percent in the case of rail travel.

Questions asked of Mr. Austin on future facilities and service indicated that airplane transportation is of great interest to producers who travel on business.

John C. Best presided over the second session which covered committee reports, the election of officers,

consideration of the budget for the fiscal year 1952-53 and talks on price control and equipment availability.

Gladys L. McBee, secretary, read the financial report in the absence of treasurer Helen McNamara, and Robert S. Boynton presented the budget which was increased considerably as a result of the percentage depletion program. It is of interest, as pointed out by Mr. Boynton, that the association has continued to operate at an accelerated pace without having increased the rate of dues since 1940. Increased membership has made this possible. A one-time special assessment of 0.6 cents per ton is being levied on commercial quicklime tonnage, that benefited by percentage depletion, to help finance the special program in connection with that activity.

Safety

Kent Jander, chemical engineer of the association, reported on the N.L.A. safety competition and announced the winners of the 1951 competition. He first recounted the early history of the safety contest, which has been conducted for 17 years. The movement was started during the N.R.A. days and, at the 1934 annual convention, it was pointed out how an effective safety program could not only save lives but reduce operating costs importantly. It was pointed out then that a \$1 saving in lower nationwide compensation rates could save the lime industry a half million dollars which, said Mr. Jander, would effect more than double that saving today.

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The first contest got underway in the mid-year of 1935 when nine plants had perfect records qualifying them to receive Certificates of Honor. To date, a total of 154 certificates has been awarded, and the Thomasville plant of The J. E. Baker Co. has the outstanding record of having won 12 certificates. As of today there are only nine plants that have participated in all the competitions since 1935 and from 40-45 plants are currently enrolled.

Mr. Jander emphasized the growing importance of safety by citing the proposed Humphrey bill which would interject the federal government into control over industry safety. He mentioned the outstanding record of the portland cement industry in safety as an example of what can be done to reduce frequency and severity rates.

For the year 1951, twelve plants completed the year without accidents in the four categories and were awarded certificates. The winners were as follows:

In Group (A1)—quarry and calcining plants working 100,000 or more man-hours:

(1) Natividad plant of Kaiser Aluminum and Chemical Corp.

(2) Luckey plant of National Gypsum Co.

(3) Knoxville plant of Standard Lime and Stone Co.

In Group (A2)—quarry and calcining plants working less than 100,000 man-hours:

(4) Thomasville plant of The J. E. Baker Co.

(5) McCoy plant of the Warner Co.

(6) Ripplemead plant of Ripplemead Lime Co., Inc.

(7) Frederick plant of Shank and Etzler Lime Co.

(8) Valders plant of Valders Lime and Stone Co.

In Group (B)—underground mine and calcining plants:

(9) Bellefonte plant of the Warner Co.

(10) Quincy plant of Menke Stone and Lime Co.

In Group (C)—lime calcining plants without associated quarry and mine:

(11) Buffalo plant of The Kelley Island Lime and Transport Co.

(12) Springfield plant of Ash Grove Lime and Portland Cement Co.

Price Control

Walter H. Acheson, chief, Building Materials Branch, O.P.S., conducted an "Informal Open Forum on Government Price Control" in which he brought out new developments and answered questions. His discussion principally covered consideration of the earnings standard, the freight situation and proposed new regulations.

The earnings standard, which is a yardstick, entitles industry to earn not less than 85 percent of the current earnings for the best three of the four years, 1946-1949. Freight costs are causing the greatest difficulty and, thusfar, efforts to have freight rate increases reflect in higher prices have failed completely. An industry must be able to prove that it cannot absorb freight charges to be considered for price relief, which also holds for increased labor costs, etc. Since the recently granted freight rate increases, efforts have been renewed for price relief but no action has been taken. If a company sells on an f.o.b. plant basis, there is no problem, as pointed out by Mr. Acheson.

New regulations are in process of consideration for the purpose of regulating area price adjustments and individual plant adjustments, for hardship cases and Mr. Acheson believes these regulations will be passed. They are designed to delegate authority to the field for quick action. At present the industry continues to be governed by the General Ceiling Price Regulation.

Equipment and Supplies

Harold A. Montag, director, Mining Requirements Division, D.P.A., in a talk "Outlook for Mining Equipment and MRO," described procedures in obtaining equipment items, the workings of his agency and efforts being aimed at simplification. Among newer developments, attempts are being made to change the minor capital additions limitation from \$2000 up

to \$5000 and procedures are being added to govern for unusual conditions. The program calls for self-certification for emergency conditions and to simplify and speed up procedures as much as possible. As far as relaxing restrictions is concerned, as soon as categories of equipment can be bought on the open market without priorities, those categories will be decontrolled.

Mr. Montag pointed out that there may be a period of tension that will last for many years and that regulations are being rewritten with that view in mind so that a base of operations will be laid for standby use. In a jet era, preparedness is necessary in advance of war, he pointed out.

Dr. Kenneth McFarland, Topeka, Kan., a gifted speaker, concluded the second session with a lively and thought-provoking talk which he entitled "Four Buckets of Paint." He started by pointing out that when the government will spend \$100 billion a year at a time when the national income is \$300 billion the problem is to get as much out of \$2 as we were accustomed to derive from \$3 which presents a real challenge.

At present we are having the greatest man-power shortage in history with an age-group classification in which 20 million of our 154 million population is less than six years of age which is a reflection of the last war and the big depression. As far as preparedness is concerned this is a factor in our attempts to keep war and civilian production at top production simultaneously. It will cost the nation \$45 billion a year for an army even if we never use it and we are committed to a part war and part peace economy for the rest of our lives. Dr. McFarland predicted that we will catch up with Russia in the armament race by 1954.

One criticism brought out is that there is a tendency in the United States to quit doing the things that made us successes, which requires that we stop and evaluate our course of action based on known yardsticks. To emphasize that no one seems to know the economic rules anymore, he said that a survey revealed that two

(Continued on page 136)



Left: Seated around one of the banquet tables are (l. to r.) Mr. & Mrs. Bror Nordberg, ROCK PRODUCTS; Mr. & Mrs. Alan B. Cheney, Cheney Lime & Cement Co., Allgood, Ala.; Mr. & Mrs. E. D. Williams, Jr., H. E. Millard Lime & Stone Co., Annville, Penn.; and Mr. & Mrs. W. J. Barrett, New England Lime Co., Adams, Mass. Right: (l. to r.) R. C. Collins, Warner Co., Philadelphia, Penn.; John M. Junkin, Warner Co., Pittsburgh, Penn.; Mr. & Mrs. John H. Gruber, St. Regis Paper Co., Baltimore, Md.; Mr. & Mrs. J. P. Feiser, Le Gore Lime Co., Le Gore, Md.; Charles Warner, Warner Co., Philadelphia, Penn.; and Mrs. Junkin



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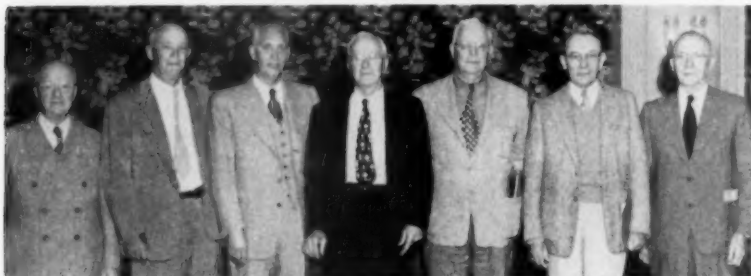
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Left: Left to right are Mr. & Mrs. G. H. Johannes, Imperial, Mo. (former lime producer); David K. Shroyer, H. E. Millard Lime & Stone Co., Annville, Penn.; official reporter for the meeting; Philip Corson, G. & W. H. Corson, Inc., Plymouth Meeting, Penn.; and Mrs. D. K. Shroyer. Right: From left are Mrs. Charles Rarey; Mr. & Mrs. L. M. Bergford, Cutter-Magner Co., Duluth, Minn.; Henry La Liberte of Cutter-Magner; Mrs. W. H. Moores; Charles Rarey, The Marblecliff Quarries Co., Columbus, Ohio; and W. H. Moores, Moores Lime Co., Springfield, Ohio



Group of "old-timers" in the lime industry. L. to r. are Henry La Liberte, Cutter-Magner Co., Duluth, Minn.; C. C. Loomis, New England Lime Co., Adams, Mass.; Wallace E. Wing, Marblehead Lime Co., president of N.L.A.; Charles Warner and Irving Warner, Warner Co., Philadelphia, Penn.; Walter Stauffer, past president of N.L.A.; and Fred Witmer, Ohio Hydrate & Supply Co., Woodville, Ohio

out of three Americans do not know when Hoover was president and one-half the people cannot remember the big depression.

Dr. McFarland was much disturbed about individual attitudes today and urged that we must again teach the concept of total responsibility whereby each individual will not continue to be guided only by direct effects on him but consider himself part of a total effort. He cited cases where individual employees refuse to go out of their way because a requested service was not his assigned responsibility. He expressed a common attitude clearly when he said that there are many workers today who actually resent their own company's ability to earn enough money to pay them wages.

He also said that we must get back to the concept of trying to render special service again to customers and to the attitude that we can do things to help customers. The American people are so fed up with graft and scandals that they have become so dangerously cynical and frustrated that it reminded Dr. McFarland of the past war period when the Germans and Italians became so distracted that they traded freedom for "order" under Hitler and Mussolini. Communism, in his opinion, has many American people unsold on the American system. Character assassination is considered dangerous and it was urged that the many good public people in this coun-

try be given recognition and encouragement.

Prof. Walter C. Voss, M.I.T., presided over the concluding session and, in his introductory remarks, summed up the accomplishments of research from 1931 when the first grant was made for research. He expressed his gratification for the results that have accrued to the industry as a result of its diversified research program.

Percentage Depletion

J. Milton Cooper, the association legal counsel, Washington, D.C., commented on percentage depletion and also on other Washington matters. He first expressed his disappointment that the regulations governing percentage depletion have not yet been written and ventured that it may be two years before the final regulations are enacted into law. In the meanwhile there is nothing to be done but to follow recommendations as issued through the association.

The picture in business has changed so much, he said, that the tax system has replaced the profit system and the main objective of management must be to save taxes. The only hope that we have of returning power back into the hands of the people is through taking an active part in electing Congress, he said, and making constructive suggestions known to Congressmen.

He summed up the four-year effort of the association which culminated in securing percentage depletion bene-

fits, which he credited to efforts of the association committee and to letters written by industry members to their Congressmen.

Many complications exist with respect to grade definitions, end use, etc., which will be considered when the regulations are published and made subject to criticism and change. The industry must be constantly alert in order not to have these benefits withdrawn.

Lime for Blast Furnaces

"Lime Injection to Blast Furnace Tuyeres" was the subject of a talk by D. M. Morrison, metallurgist, A. J. Boynton & Co., Chicago, Ill. Mr. Morrison started his talk by first describing the fundamentals of blast furnace operations and had slides to show their operation. As a typical example he described a modern blast furnace with 28-ft. hearth diameter. Height of the furnace was 110 ft. and production a ton of iron per minute. Requirement to produce a ton of iron from such a furnace would be 1.8 tons of ore, 0.9 ton of coke, more than 0.4 tons of limestone and 90,000 cu. ft. of air. Practice is to have a double-bell overhead charging system and modern plants have a turbo-blower system for the air blast. Tuyeres are below the bustle. Direct reduction takes place in the bustle area where the carbon in the coke changes the ore into iron. The iron picks up sulfur from the coke and is desulfured in passing down through the resultant slag. It is desired to have a sufficiently limey slag to take out the sulfur. Limestone as fed from the top is calcined halfway down the shaft.

Too much lime at the bustle area causes stickiness and slugging up, to restrict the diameter. Sufficient limestone is required for sulfur take-up but the least amount possible is desired to improve operation. Purpose of lime injection is to obtain closer slag control and therefore improved iron quality. As Mr. Morrison expressed it, it is necessary that a good slag be produced to produce high quality iron. It is expected that lime injection will permit greater produc-

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HOIST — Air-Assist — allows the operator to retain that important finger-tip, sensitive "feel" of just what his machine is doing.*

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* All these features apply to the Air-Assist control of Hoist, Crowd, Drag-in and Retract.

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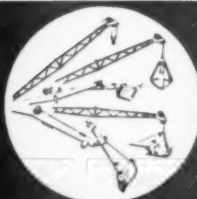


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Left: L. to r. are Prof. James A. Murray, M.I.T.; Beverly Drake of the association staff; Prof. Walter Voss, M.I.T.; Betty Reger of N.L.A. staff; P. L. Rogers, Riverton Lime & Stone Co., Inc., Riverton, Va.; Mrs. Walter Voss; John S. Hedrick, Riverton Lime & Stone Co., Inc.; and Mrs. James A. Murray. Right: L. to r. are Fred Wilton, Wrightsville, Penn.; Mr. & Mrs. C. C. Loomis, New England Lime Co., Adams, Mass.; C. L. Montgomery, Vermont Marble Co., W. Rutland, Vt.; David Follett, W.J. Ash and R. J. Pierson, all of New England Lime Co.

tion of iron at lowered cost and that the process may permit use of poorer grade ore.

An actual installation is being made at the Clairton, Penn., plant of U. S. Steel Co. where lime from a storage hopper will be conveyed to an ejector chamber and forced by compressed air to connections between the bustle pipe and the tuyeres. About 10 tons an hour will be the requirement. The potential market, nationally, could be 2,700,000 tons annually. It is possible that ground limestone may be tried in the process. Preliminary tests at Clairton have used minus 20-mesh lime but a minus 4-in. product is to be tried. Air requirement is 50 cu. ft. per lb. of lime. Lime utilization will be reduced for higher grade ores such as Venezuelan ore.

Fundamental Research

Prof. James A. Murray, M.I.T., in his annual report on the fundamental research fellowship, covered work being done on slaking of limes, plasticity and in burning lime. He discussed in some detail apparatus developed and used for slaking tests and for measures of plasticity. Among graphical data presented, on slaking, were temperature rise plotted with time and with added slaking water and showing the effect of amount of slaking water on rate of slaking.

Much work was done this past year on plasticity and in the development of data on the property for various limes. Prof. Murray had reported on studies of the burning of pure calcite two years ago, as a base for the evaluation of different limestones. Results of work with an average high calcium limestone were reported a year ago. These studies of limestones developed fluxing and kiln ring formation at different temperatures for different limestones, so work is being concentrated on determining the cause of the unexpected glass formation which results in slag build-up. Some 30 samples of $\frac{3}{4}$ -in. limestone have

been accumulated thusfar from member companies which will be subjected to complete analyses in an attempt to correlate test data with glass formation. Professor Murray said that he hoped to report findings on these studies at the fall meeting. Plasticity studies are to be continued.

Neutralization of Lakes

Roland F. Smith, New Jersey Fisheries Laboratory, New Brunswick, N.J., presented some interesting results from studies made in the neutralization of ponds and lakes for the purpose of promoting fish growth and reproduction. He described the correlation between soil minerals and the acidity or alkalinity of lakes and ponds. Most of the waters in New Jersey are acid to varying degrees; some having a pH as low as 3-3.5, which has a direct adverse effect on bass and bluegills. Studies have shown pH to be an index of the species and quantity of fish. In general, a pH below 4 is not favorable for fish life and, thusfar, work has been done only on ponds of low pH.

Application of hydrated high calcium lime and limestone to these waters has given good results. Ponds of 2.5-3 pH which supported no fish life have been alkalized and then stocked with bass and bluegills which have survived. Reproduction of bass has been good in 4-4.5 pH waters that have been alkalized. Generally, one to two applications of lime are necessary annually. Application of lime, broadcast over the water, is effective in raising the pH from 4.5 to as high as 9 within six hours. Limestone requires several months to accomplish such change.

Optimum neutrality is in the range of 7-8.5 pH and should be above 6 for reproduction of bass and bluegills. Lime application has been 3-5 lb. per 100 cu. ft. of water.

Entertainment

Entertainment included the annual reception and banquet, an association

bingo party with special prizes awarded the ladies by the N.L.A. and golf and other recreation available at the Homestead.

Weights and Measures Book

NATIONAL BUREAU OF STANDARDS recently announced the publication of an 1182-page fabrikoid-bound book, "Federal and State Weights and Measures Laws" (through 1949 enactments).

This compilation of weights and measures laws supersedes three earlier volumes published by N.B.S. in 1904, 1912 and 1926. The information presented comprises an up-to-date collection of federal laws and regulations and state laws dealing with the regulatory control of commercial weighing and measuring equipment and practices. The book includes a comprehensive index of the entire volume and separate detailed tables of contents for the laws of each state and for federal laws.

The book may be obtained from the Government Printing Office, Washington 25, D.C., for \$5.75 per copy. Foreign remittances must be in U.S. exchange and should include an additional one-third publication price to cover mailing costs.

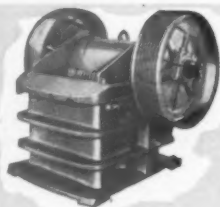
Vermiculite Research

ZONOLITE Co., Chicago, Ill., has allocated \$150,000 for its new laboratory in Evanston, Ill., for basic research in vermiculite, it was announced recently by Dr. George Ziegler, research director. The new laboratory is devoted to research in chemistry, physics and engineering for vermiculite and vermiculite products. Its aims are to provide data that will help expand the markets of present products, and basic research to aid other industrial laboratories in solving their problems through new uses of vermiculite.

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For 32 years Lippmann engineers have specialized in the design and construction of machinery and plants to produce crushed stone, sand and gravel. During that time they have earned the confidence of the industry to the extent that Lippmann equipment is the choice of many leading aggregate producers and contractors.

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Sizes up to 36 x 48 inches (the largest overhead eccentric jaw crusher made). Features 25% more crushing area, non-choking construction, maximum output, minimum power use and maintenance.



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Revolutionary anti-friction gyratory operation with parallel shaft rotation results in lighter weight, less power consumption, reduced maintenance and controlled product size. Sizes 25 to 72 inches.



ROLL CRUSHERS

Offer real economy in secondary crushing. Exact product size control; tapered roller bearings; a variety of shell face patterns available; easily replaceable wear plates reduce maintenance. Sizes up to 72" x 24" rolls.

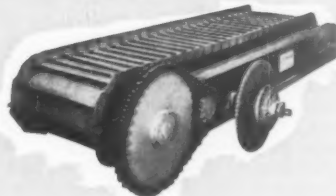


CONVEYORS

Complete line of both portable and stationary conveyors. Lippmann Life-Sealed ball bearing conveyor idlers are outstanding for lower first cost and maintenance. Ball bearings are lubricated for life.

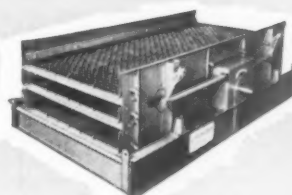
APRON FEEDERS

LIPPMANN makes apron feeders and plate feeders to meet all feeding requirements. Every design has been thoroughly proven by rigorous field service and built for long wear and low power requirements.



SCREENS

Vibrating screen pictured is positive eccentric type with equally distributed vibration for maximum capacity. Vibration contained in screen body entirely. All sizes, single and multi-deck.



PORTABLE PLANTS

Portable washing plants, as pictured, combine scrubber, vibrating screen, sand drag, conveyors. Capacities up to 120 cu. yd. per hour. Lippmann also makes trailer and self-propelled crushing plants including screening and loading elements.



PULVERIZERS

An unusual design of hammer-type crusher with unmatched records of capacity, product size and quality control, low first-cost and ease of maintenance. Manganese hammers, forged hammer arms and other outstanding design features. Sizes up to 40" x 36".

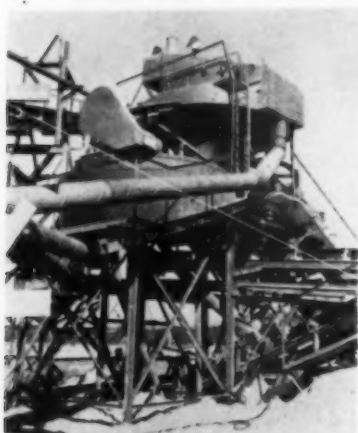


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CRUSHERS FEEDERS SCREENS CONVEYORS ELEVATORS HOPPERS BINS



A clean product is assured through the use of two 16-ft. sand washers operated in series

SAND, A CLEAN, sharp, high silica sand of such a fineness modulus that it can meet concrete sand specifications, is not plentiful in Florida. Much of the sand in that state is a beach sand, usually quite fine and containing varying amounts of sea shell fragments. There can be exceptions to this generalization; deposits range from high silica—such as at Starke which is mostly a minus 48-mesh product and relatively high in silica—to the material that will be used as a source of limestone for a new cement plant now under construction in Florida. This latter deposit is high in shell fragments and will be the source of the calcium carbonate used in the manufacture of portland cement. Here again the silica particles are quite fine. Most of the sand that can be classed as a concrete sand formerly came into the state from Georgia and South Carolina.

With this in mind, it is news when

INTERBLENDING COARSE PARTICLES TO MEET CONCRETE SAND SPECIFICATIONS

a new sand plant goes into operation in Florida. The new operation is near Mulberry, which is the heart of the phosphate producing area about 20 miles east of Tampa. The new company is known as Oak Ridge Sand Co.

In the Mulberry area, completely surrounded by phosphate mine operations, is a ridge or bar of silica sand. It is light yellow in color and is not to be considered a glass sand. This deposit meets all the requirements except for the larger sizes of sand such as the plus 10 mesh minus $\frac{1}{4}$ in., so coarse sand is shipped into the area from Cheraw, S.C., and is blended with the new plant's output. The company built a 2.9 mile railroad spur to reach the deposit.

The new operation is using an 8-in. type G Morris dredge pump that delivers the material to a flat screen. This flat screen acts as a scalper, removing trash and lumps of clay. The material that passes through the screen drops into a cone which has an overflow weir completely around its periphery. Clear water is added at the bottom of the cone and the slimes are washed out of the sand, discharging over the overflow weir at the top

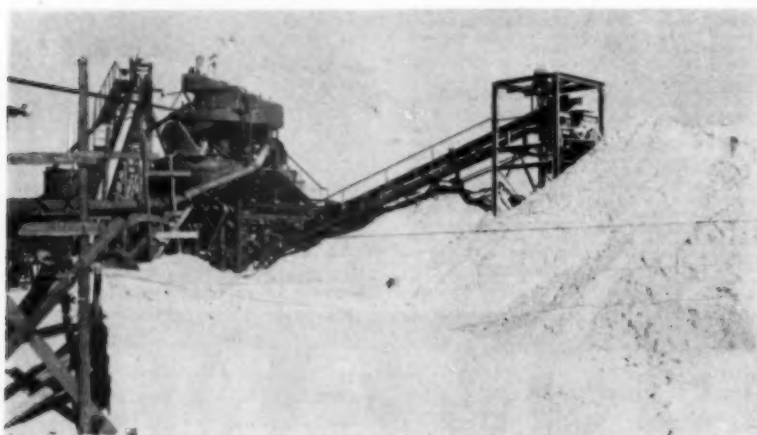
of the cone. Sand settles to the bottom of the cone and is withdrawn and introduced into a Dorr sand washer.

There are two Dorr sand washers in the plant, operated in series. The material enters the first sand washer at a high percentage of solids and clear water is introduced to give a scrubbing action, thereby eliminating more slime. A further washing is done in the second sand washer in the same manner. Approximately 1800 g.p.m. of clear water is used at the plant to wash the sand.

The sand washers consist of a rabble arm to which plows are attached. These operate in a sloping tank. About half the area of the tank is devoted to the pulp or is the settling area. As the arms revolve, the sand is picked up by the rakes, drains a short period of time and then is discharged from the machine. The finished sand at the Oak Ridge operation falls to a belt conveyor that delivers to a Stephens-Adamson carloader mounted at the outboard end of the conveyor, or else a shuttle belt can load it to cars. The carloader is a short, high speed belt conveyor that picks up the sand and literally throws it away from the end of the main belt. It permits a much larger stockpile to be built than would be the case without it. Reclaiming from the stockpile is accomplished by a $\frac{3}{4}$ -cu. yd. Sauerman slackline cableway that delivers to the loading system.

The suction of the dredge is a flared bell; no cutter is required. It digs to approximately 23 ft. below water with a total thickness of sand of about 40 ft. The silica bed is underlaid with a kaolin clay that is not disturbed. The plant has a capacity of 200 t.p.h. The market area includes the industrial areas of Tampa and vicinity, though shipments go as far as Miami. The plant is served by the Atlantic Coast Line railroad.

The coarse sand that comes from South Carolina arrives in open hoppers and is dumped to a track hopper. Water jets at 95 p.s.i. operating in this narrow, sloping-sided hopper



Oak Ridge Sand Co. operation at Mulberry, Fla. The two sand washers (left) are operated in series. At the outboard end of the conveyor (right) a car-loader is used for building the storage pile; it permits building a larger stockpile by literally throwing the sand away from the end of the main belt

(Continued on page 146)

13 Year SECO "Workhorse"

in service in North Carolina



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When you consider the millions of tons of material that have been placed on this screen during thirteen years of service, you begin to wonder how any piece of moving equipment could stand up this long.

The simple reason why Seco vibrating screens stay on the job year after year with little or no maintenance is that they stay in balance. Seco's exclusive equalizer assembly sets up a fully controlled true circular action of the live screen which is not transmitted into the base frame or supporting structure. There's no bobbing, no weaving, no undue stress on bearings or other moving parts.

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Vermiculite

PRODUCT APPLICATIONS AND SPECIFICATIONS FOR VERMICULITE CONCRETE

Vermiculite Institute's annual meeting features new uses for
lightweight vermiculite, specifications and research reports

VERMICULITE INSTITUTE of Chicago held its annual meeting at the Arizona Inn in Tucson April 1-5. It was attended by vermiculite processors from all parts of the nation and Canada, including two representatives from Honolulu, Hawaii. G. R. Stark of Texas Vermiculite Co., Austin, president of the institute, presided. The group was welcomed to Tucson by Mayor Frederic Emery.

Tilt-up Construction

Test results on vermiculite concrete sandwich panels in tilt-up construction were discussed by F. Thomas Collins, consulting engineer of San Gabriel, Calif., who was commissioned by the institute to make certain strength tests of vermiculite concrete in this type of construction, including shear and transverse loading. In such panels, the vermiculite concrete core is encased on both sides with a relatively thin layer of sand concrete. The thickness of the sand concrete is designed to provide the necessary strength. The thickness of the vermiculite concrete core is determined by wall thickness and insulation requirements.

Tilt-up construction is being used extensively on the Pacific Coast and in projects throughout the nation, Mr. Collins said, and buildings from one to eight stories high can be erected using this method. One of its great advantages is the large saving in material and skilled labor. The walls are cast in panels at the site, using the floor slab of the building as a horizontal casting platform. Pilasters and other structural members may be handled the same way. The floor slab is coated with a bond breaking agent to prevent a bond between the floor and the cast concrete when it is ready for tilting into place by a mobile truck crane. On a typical building, four panels an hour can be erected, according to Mr. Collins.

The light weight and resilience of vermiculite concrete make it an ideal material for tilt-up construction, he pointed out.

A motion picture of tilt-up vermi-

culite concrete construction in western Canada was shown by L. G. McDiarmid of Insulation Industries, Vancouver, B.C. Mr. McDiarmid said that the building photographed had been erected for one-third less than the cost would have been with any other form of masonry construction.

Two new pumps for placing vermiculite concrete in roof and floor construction were described by R. W. Sterrett of Southern Zonolite Co., Atlanta, Ga., and W. M. Binford of the Marine Engineering & Supply Co., Los Angeles, Calif. With a pump, mixing can be done in one central location and the wet concrete conveyed through a hose. Mr. Sterrett said it



C. A. Pratt, president of Vermiculite Institute

was possible to go to a height of 150 ft. with the pump he has developed, and that it will place about 8 cu. yd. of concrete an hour.

W. R. Simpson of Vermiculite Products Corp., Washington, D.C., chairman of the concrete committee, distributed copies of the institute's new specifications for vermiculite concrete floors, the result of five years of field testing.

Newcomers and old-timers in the industry put on a panel discussion moderated by L. J. Venard of Western Mineral Products Co., Minneapolis, Minn. A. T. Kearney, Zonolite Co.,

Chicago, and Glenn Sucetti, California Zonolite Co., Sacramento, Calif., described early equipment and primitive mining of vermiculite ore at Libby, Mont.

Vermiculite-Gypsum Plaster

Guest speaker L. H. Yeager, general manager of the Gypsum Association, Chicago, told the members that savings in structural steel and cost reductions up to \$4 per sq. ft. in a typical 3-story building can be made with light steel framing fireproofed with lightweight vermiculite-gypsum plaster. Mr. Yeager said that the Gypsum Association had commissioned a noted firm of architects to design and compare, cost-wise, three different types of construction for a hypothetical 3-story office-store building containing 5880 sq. ft. One had light steel frame construction fireproofed with lightweight plaster. The second had a heavier steel frame protected with concrete. The third had a reinforced concrete frame.

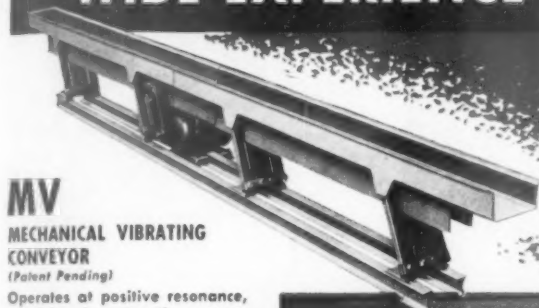
Comparison showed that the cost of the light steel building was almost \$24,000 less than the steel frame protected by concrete, and \$10,000 less than the reinforced concrete frame, Mr. Yeager stated. Other advantages included quicker erection and closing-in against weather; minimum time loss because of weather interruptions; and less formwork and scaffolding.

"The owner benefits by getting flat ceilings unbroken by beams, as well as more usable room since fewer columns and walls obstruct the flow of activity within the finished store or office," Mr. Yeager added. "Light steel frame buildings can now be designed to meet any building code requirements for structural strength and fire protection."

Research

C. A. Pratt of Western Mineral Products Co., chairman of the technical committee, said that the institute has accumulated a tremendous backlog of test data and technical information of interest to the building industry.

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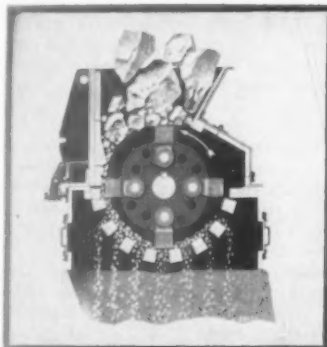
Operates at positive resonance, resulting in attractive power savings. Flexibility of design provides ruggedness required for any job and permits use of open or enclosed pan or tubular conveying decks. Floor or suspension mounting without loss of capacity. Bulletin No. 826.

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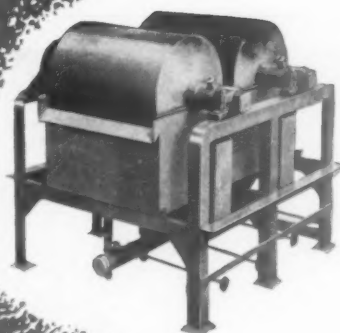
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Type shown is 3040 two-drum. Wet process types for effective separation of magnetic iron ore concentrates. A high and clean recovery.

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Ackley, W. Va.	Buffalo 2	Cleveland 15	Ferry Port, Pa.	Jacksonville 1	Philadelphia 3	Salt Lake City 1
Stratford 3	Chicago 1	Denver 2	Norfolk, Ky.	Indianapolis 1	Pittsburgh 12	

Jeffrey Mfg. Co. Ltd., Montreal, Canada
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 Galloway (Green) Spinning Ltd., Walsfield, England
 The Ohio Machine & Iron Co., Columbus, Ohio





Members attending the Vermiculite Institute's annual meeting in Tucson, Ariz., pose for a group picture

try generally, and presented a plan for organizing a new technical service department to coordinate vermiculite products with those of allied industries. The plan was accepted.

Dayton L. Prouty, Zonolite Co., Detroit, Mich., chairman of the plaster committee, distributed a comprehensive report showing results of a large number of tests conducted during the past year. Included in this were the new institute specifications for vermiculite plastering and acoustical plastic, voted one of the 12 best new materials specifications at the recent meeting of the American Institute of Architects in St. Louis.

Mr. Prouty said that tests of vermiculite acoustical plastic indicated remarkable bond strength to the base coat. Three square feet of this acoustical plastic developed sufficient bond to support the weight of an average automobile. He also pointed out that 2½-in. solid vermiculite plaster partitions on both metal and gypsum lath were the first to secure a 2-hour fire rating. This is important to architects and builders, because stairwells and elevator shafts in most public buildings require at least a 2-hour rating.

Dr. George E. Ziegler, director of research, Zonolite Co., Chicago, and Dr. R. F. Rea, one of its engineers, discussed the outstanding physical equipment and research program of the firm's new laboratory in Evanston, Ill. One of the innovations, now in the planning stage, will bring in journeymen plasterers to check the workability of various types of plaster with a view of developing mixes that will have the best working characteristics and provide the most satisfactory wall to the ultimate consumer. This work will be done in the laboratory with full-size batches of materials, so that a study can be made of practical application methods.

S. K. Robinson of F. Hyde & Co., Montreal, Que., chairman of the insulation committee, reported a substantial growth in the use of vermiculite for insulating purposes. He said that the spectacular use of vermi-

culite fill to insulate hot steel ingots for rail shipment had focused attention on the insulating efficiency of the material and its fireproofing value as well.

Other speakers were A. T. Kearney, president, and W. J. Bein, vice-president, Zonolite Co. Mr. Kearney said that the production of vermiculite by Zonolite had increased more than 25 times in the past decade alone, and predicted a continuation of expansion because of new uses for vermiculite that are constantly being developed. Mr. Bein appealed to the members for active interest in local and national government, and to urge their employees to vote at the coming election.

Dr. John Van De Water, guest speaker from the University of California at Los Angeles, described the activities of subversive groups in undermining the moral fiber of university students and industrial labor, and some of the measures being taken to combat this threat to the nation.

At the business meeting, L. G. McDiarmid and Frank John of Zonolite Insulation Co., St. Louis, Mo., were elected to the board of directors. C. A. Pratt was elected president of the institute to succeed Mr. Stark.

The annual banquet was held at the Arizona Inn, with entertainment provided by the celebrated Tucson Arizona Boys' Chorus under the direction of Eduardo Caso. The chorus has already been engaged to sing at the coronation of Britain's queen next year. A trip to Grand Canyon National Park concluded the meeting.

Improving Livestock Through Liming

RATIONAL USE OF LIMING materials and fertilizers to produce more high quality feed for livestock received emphasis at a recent conference on lime and fertilizer in Columbus, Ohio. One of the statements made was that the main deficiency in the livestock feeding program in Ohio is that livestock do not have enough to eat at all times.

There was also a discussion of the fact that the farmers who have the best yields and best livestock production have, on the average, the highest incomes; and that the use of fertilizers and liming materials is a profitable practice, especially when they are a part of a good farm program.

T. S. Sutton, head, Department of Animal Science, Ohio State University, discussed improving livestock feeding through the use of liming materials and fertilizers.

The main reason for using liming materials and fertilizers is to increase crop yields. This increase in crop yields makes a definite contribution to the livestock feeding program in Ohio, he said.

The main nutrient deficiency in livestock feeding in Ohio is a lack of feed, he said. This means poor livestock, unsatisfactory performance and lack of profits. Sound agronomy practices, including the use of liming materials and fertilizers, result in the improvement of the livestock enterprise.

This improvement is due to a greater abundance of feed rather than to the presence of a mysterious trace element or vitamin, Mr. Sutton noted. These practices enable the farmer to grow the highly nutritious legume forage plants and eliminate the less desirable plants. Legumes are richer in protein, calcium, phosphorus and certain trace elements than are the grasses. This is especially noticeable with cobalt. Grass should be included in the mixture when the field is to be pastured part or all the time.

Increased yields and greater abundance of feed are the main benefits to the livestock enterprises resulting from use of liming materials and fertilizers and the end product is plenty of nutrients, he concluded. Any trace elements likely to be lacking should be added in grain.

Floyd DeLashmutt, extension economist, in discussing farm management, said that liming as needed and the liberal use of fertilizers are profitable, especially when they are a part of a well-balanced farm program.

"Bulk Distribution of Liming Materials and Fertilizers," was the topic of John Stark, G.L.F. Soil Building Service, Bridgeton, N.J. Most of the liming materials applied in Ohio are now spread by the trucks which bring them to the farm. During the last few years a number of men who operate a lime-spreading service are spreading fertilizers on meadows and pastures. Mr. Stark discussed the necessity of careful driving, careful adjustment of the machinery, etc., so that the farmers may secure best returns from the spreading of liming materials and fertilizers.

T. J. Bosman, Federal Chemical Co., Nashville, Tenn., reviewed the development of the fertilizer industry. He said that about one-fourth of the present crop production of the country is due to the use of fertilizers.



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LE-HI Makes a Good Connection!



Meeting Sand Specs

(Continued from page 140)

wash the sand to the suction of a small pump (4 in.) and deliver it to a steel bin. As the sand is relatively coarse, drainage is not a problem. Under the gate of the coarse sand bin is a Syntrol electrical vibrating feeder that blends the coarser sand to the loading belt. Additional sand recovery equipment may be installed

later to recover more of the fines. The plant is of steel construction, designed by the staff and built by a local contractor.

The company, with offices in Mulberry, is controlled by the R. H. Clark Equipment Co., Inc., a dealer and distributor of a wide line of mining and milling equipment in the area. J. W. Booream is president of the company. R. B. Bergquist is superintendent of the sand plant.



An 8-in. dredge pump delivers the material to a flat screen, which acts as a scalper. No cutter is required on the dredge; it digs to about 23 ft. below the water

N.S.G.A. Research and Related Activities

THE NATIONAL SAND AND GRAVEL ASSOCIATION, in Technical Information Letter No. 87, has summarized a number of its present research projects and discusses plans for future activities.

N.S.G.A. announces that this year it is inaugurating a new special laboratory training course, open to eligible representatives of member companies. The course was organized to be applicable to a man capable of conducting laboratory work on his own initiative, depending principally on the laboratory staff for consultation and advice, rather than detailed and continuous instruction. The first student was William E. Hole, Jr., son of W. Edward Hole, president of American Aggregates Corp. Selection of trainees for the present is being restricted to those with an engineering degree, or its equivalent, and also having the ability to conduct work at the graduate level on their own initiative. Only two trainees will be accepted for any one period.

In connection with some studies pertaining to the effect of moisture condition of aggregates, chert gravels, in various conditions of saturation and from two different sources, were incorporated in concrete and subjected to freezing and thawing. The results of the test were said to show the high importance of the moisture condition of the aggregate and to confirm earlier studies along these lines.

Another project was a study of the effect of the sequence in which an air-entraining admixture was batched on the strength and air content of air-entrained concrete. The study was outlined because of a claim that if the air-entraining agent were given opportunity to coat the aggregate, the bond between the cement paste and the aggregates would be impaired. The investigation failed to show any such effect on the bond, but did show that batching sequence and mixing conditions affected the amount of air entrained with some subsequent effect on the strength.

Another test concerned the effect of adding certain crusher screenings to natural sand. Results showed that while the addition of the screenings to the natural sand resulted in higher losses in conventional soundness tests, there was no adverse effect on the resistance of the concrete to freezing and thawing. On the contrary, resistance was somewhat improved, probably due to the screenings supplying a slight deficiency of fines in the natural sands.

N.S.G.A. stated that in future laboratory tests, greater emphasis would be placed on bituminous mixtures. The laboratory is in the process of being equipped for making both the Hub-

Researches

Included in the review of researches being conducted at the laboratory was a report on cylinder molds, involving comparisons of cardboard cartons as cylinder molds. While the cardboard cartons were found to vary greatly in respect to the amount of absorption and expansion, the results of the strength tests were all about the same.

In the freezing and thawing tests, it was reported that the manufacture of specimens has now been completed for a comparison of the various types of freezing and thawing tests. Three curing conditions and six freezing and thawing exposures are involved.

"NITRAMON" and millisecond interval firing give excellent breakage in tough shooting quarry



1. Pitching and laminated face in southern limestone quarry presents difficult problem in obtaining good fragmentation. Problem was solved by using "Nitramon,"

and firing holes at millisecond intervals. The shot consisted of 14 holes spaced about 16 ft. apart and 17 ft. back from the face. Holes were approximately 70 ft. deep.



2. Safe, simplified loading. Workmen lower "Nitramon," packed in watertight containers, into drill hole. "Nitramon" offers maximum safety and convenience in loading. It cannot be detonated with commercial blasting caps, or by open flame, friction or the impact of falling objects. Yet "Nitramon" Primer—itsself relatively insensitive—consistently detonates the charge.



3. Preparation for firing includes this simple safety precaution. The caps have already been attached to a Primacord tail and the electrical circuits completely wired and tested. The workman is about to attach the Primacord tail to the down line in the loaded hole just a few minutes before firing the blast, thus insuring maximum protection from prematures due to lightning or stray currents.



4. View of shot. The charge consisted of 6,870 lbs. of 5 1/2" diameter "Nitramon." Superior fragmentation was assured not only by the excellent spreading action of "Nitramon," but also by firing the holes at 15 millisecond intervals with a Du Pont Blasting Timer. This greatly reduced vibration . . . another important consideration with this quarry.



Result shows excellent fragmentation. This typical shot produced about 24,000 tons of limestone, requiring a minimum of rock holding.

More and more quarry owners are taking advantage of the superior safety, convenience and economy of "Nitramon." Consult the Du Pont Explosives representative in your area for complete information. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT "NITRAMON"

A Product of Du Pont Explosives Research



150th Anniversary

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At the Bessemer Limestone and Cement Company, Bessemer, Pa., one McCarthy unit averages 90 ft. per hr., working through a facing of blue shale 34 ft. deep. Holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. Another McCarthy unit has been installed in a different section of this quarry and it, too, is breaking all previous records for fast, low cost shot hole drilling. McCarthy Drills operate with all types of power units on all types of mounts. Write today for full facts about this finger-tip controlled money saver



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bard-Field and the Marshall stability tests.

Another project in progress is the making of physical tests on a considerable number of samples of gravel ballast which are being furnished by cooperating railroads. This program also includes furnishing samples of crushed stone ballast to the National Crushed Stone Association and of slag to the National Slag Association. The purpose of the investigation is to develop criteria for specification limits on roadway ballast.

N.S.G.A. included in its summary of projects fine-aggregate grading specifications now under consideration by A.S.T.M. Committee C-9 on Concrete and Concrete Aggregates and has asked member companies for comments as to how these specifications would affect their product. The specifications were listed as follows:

(a) Sieve analysis: Fine aggregate, except as provided in subparagraph (b), shall be graded within the following limits:

Sieve	Percent passing
3/4 in.	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10

(b) The minimum percentages shown above for material passing the No. 50 and No. 100 sieves may be reduced to 5 and 0, respectively, if the aggregate is to be used in air-entrained concrete containing more than 4½ bags of cement per cu. yd., or in non-air-entrained concrete containing more than 5½ bags of cement per cu. yd., or if an approved mineral admixture is used to supply the deficiency in percentages passing these sieves. Air-entrained concrete is here considered to be concrete containing air-entraining cement or agent and having an air content of more than 3 percent.

(c) The fine aggregate shall not have more than 45 percent retained between any two consecutive sieves of those shown in subparagraph (a) and its fineness modulus shall be not less than 2.3 nor more than 3.1.

(d) If the fineness modulus varies by more than 0.20 from the value assumed in selecting proportions for the concrete, the fine aggregate shall be rejected unless suitable adjustments are made in concrete proportions to compensate for the difference in grading.

Another test report concerned age-strength relationships for concrete. The rate of strength development, particularly between the ages of 7 and 28 days, is of particular interest to producers furnishing concrete in a strength specification which is usually based on 28-day strength. The ability to determine ahead of time what strengths will be developed may enable the producer to adjust his proportions for greater economy. An analysis of strength data from 13 different research projects conducted at the research laboratory showed

that no single formula, due to too many variables involved, could be used to provide a dependable prediction of 28-day strength from 7-day strength. However, it was found that formulas could be used to determine the minimum strength below which concrete would not usually be expected to fail, as well as the maximum strength likely to be obtained. According to the formulas developed, on the average, concrete which developed 1600 p.s.i. at 7 days would be expected to produce about 2600 p.s.i. at 28 days. It was pointed out, however, that in any individual case, the 28-day strength would probably fall slightly above or below this value, but it is at least an indication of probable strength development.

It is believed that the relationships thus established may also be of value in detecting abnormalities in testing techniques. An unexpectedly high or low 28-day strength may be attributable to improper curing, to failure to start laboratory curing at an early enough age, or to faulty capping or testing of specimens.

Cement Plant Expansion

DEWEY PORTLAND CEMENT CO., Kansas City, Mo., recently received approval from the National Production Authority for a \$2,000,000 expansion program for its Davenport, Iowa, plant. The proposed expansion of facilities will include the replacement of old kilns. The resulting increased production is to increase the supply of cement in eastern Iowa and western Illinois.

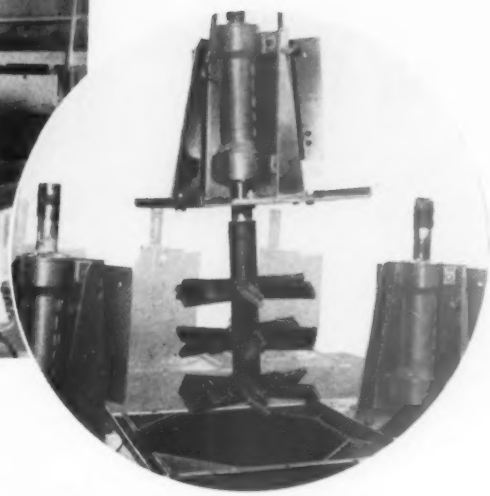
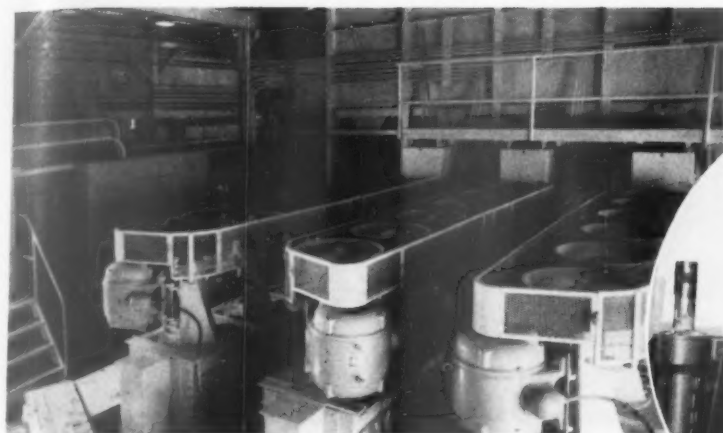
Roofing Granules

WENDELL MINERAL PRODUCTS, LTD., recently began production of roofing shingle granules at its new plant at Landrienne, Quebec. Until now, Canada had imported 75 percent of its requirements, valued at \$2,500,000 per year. Based on current consumption of 125,000 tons per year, engineering reports indicate potential supply at the Wendell property for all domestic requirements for 75 years. Walter Graw is president of the firm and J. M. LaFon is vice-president.

Hungry Horse Concrete Placement Nearing End

WITH 700,000 CU. YD. OF CONCRETE yet to be placed at Hungry Horse dam in Montana, the last of the concrete is scheduled to be placed by October, 1952. Final concreting will be followed by cooling, form stripping and incidental construction. The dam project is scheduled for completion by November, 1953.

Last year 1,378,000 cu. yd. of concrete were placed and the dam now contains 2,401,000 cu. yd. of concrete. The world's third highest and fourth largest dam will be 564 ft. high when completed; the dam and powerhouse will contain about 3,100,000 cu. yd. of concrete.



Get Higher Recovery— Improved Quality— with the **WEMCO ATTRITION MACHINE**

Here is a **new** machine that gives you an economical—
a **profitable** solution to two important problems:

- 1** Efficient processing of ores and industrial sands having excessive surface coatings.
- 2** Liberation of cemented materials.

If either of these problems exists in your operations, the **WEMCO ATTRITION MACHINE** will give you improved quality of your product or higher recovery at a given quality.

RECOVERIES INCREASED AS MUCH AS 3 TIMES!

- Actual pilot plant tests of attritioning on the retreatment of tungsten tailings improved recovery from 22% to 68%!
- Similar tests on refloatation of gold from rejects increased recovery from 20% to 65%!
- Glass sand recovery by flotation after attritioning increased from 80% to 95%!

The wide adaptability of the WEMCO Attrition Machine has been proved by actual plant operation and pilot plant tests. Here are a few examples of results obtained:

Tungsten ore—Substantial improvement of flotation grade and recovery in the retreatment of former tailings.

Uranium ores—Liberation of uranium minerals in the cementing material of sandstone.

Glass sand production—Removal of iron oxide stain to meet market specifications.

Aggregate and sand production—Disintegration of sand and clay cementing material from aggregate, saving both aggregate and sands for marketing.

Sulfide ores—Removal of semi-oxidized coatings, making possible flotation recovery—by removal of reagent and oxide coatings on former tailings.

PRINCIPLE OF OPERATION

By controlled turbulence of high density pulps, the **WEMCO Attrition Machine** thoroughly abrades mineral and ore particles. The imparted action is decidedly more efficient and complete than similar treatment previously attempted by other methods. Power consumption is greatly decreased, averaging $3\frac{1}{2}$ to 7 kw. per ton of capacity. Maintenance and replacement costs are lowered to approximately 1 cent per ton of output.

APPLICATIONS

Treatment of Particle Surfaces

Removal of oxidized coatings
Elimination of slime coatings
Removal of reagent coatings
Surface polishing of particles

Liberation of Cemented Minerals

Ores and industrial minerals of this type may be separated, either the particles or the cementing material being recoverable for valuable mineral content.

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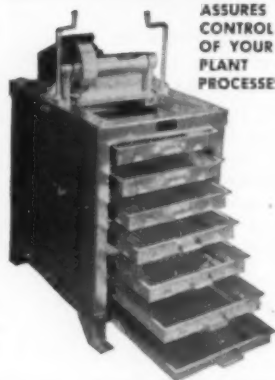


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New board of directors of the Perlite Institute, shown during the institute's convention at the Camelback Inn, Phoenix, Ariz. Left to right are Lewis Lloyd, New Orleans, La.; Bud Howell, Memphis, Tenn.; R. L. Davis, secretary, New York, N.Y.; Arthur A. Raitt (featured speaker), Los Angeles, Calif.; John Bruck, president, St. Louis, Mo.; Donald Gott, New York, N.Y.; Jack Kingsbury, Joliet, Ill. Not present at the time was K. E. Hazelton, vice-president

Perlite Institute Holds Spring Meeting

THE PERLITE INSTITUTE recently held its spring session at the Camelback Inn, Phoenix, Ariz. Fifty-two institute members registered for the convention, representing 22 states. The members expressed pleasure at convening in Arizona, for that state might be called the birthplace of commercial mining and processing of perlite. It was in Arizona, in the early 1940's, that perlite was originally proved and the first commercial mining operations took place at Superior, near Phoenix. No Perlite Institute existed at that time other than in the minds of a few producers who desired to set up standards and specifications for the new material.

The spring session also served to introduce many members to the new institute secretary, R. L. Davis. In his opening address, Mr. Davis praised the progress the industry has made in the few years it has been in existence, and pointed out the markets the industry can anticipate. He commented further that the recent successful fire tests using perlite-gypsum plaster, conducted by Underwriters' Laboratory, had displayed material savings, and that the institute would press a vigorous campaign for further fireproofing tests in the coming year.

The three days of the institute session were occupied with committee meetings and open sessions for members and guests. One of the results of committee action was the Perlite Certification Program, which it was stated will assure the building professions that any bag of perlite containing the Perlite Institute insignia will comply with specifications laid down by A.S.T.M. and A.S.A.

The guest speaker at the convention was Arthur T. Raitt, executive manager, California Lathing and Plastering Contractors' Association. Mr. Raitt discussed the progress of

perlite in the state of California and endorsed the Perlite Certification Program as a safeguard for the contractor against inferior products, and as a means of obtaining the public's confidence.

Lime Sales

DOMESTIC SALES of open-market lime in January and February, 1952, totaled 662,641 and 642,787 short tons, respectively, as reported by the Bureau of Mines. Sales by types and major uses were as follows:

Types:	Short Tons	
	January	February
Quicklime	529,862	500,806
Hydrated lime	132,779	141,987
Total*	662,641	642,787
Uses:		
Agricultural:		
Quicklime	2,604	2,871
Hydrated lime	10,773	16,183
Total	13,377	19,054
Building:		
Quicklime	15,725	15,379
Hydrated lime	63,780	68,844
Total	79,505	84,223
Chemical and other industrial:		
Quicklime	335,729	317,125
Hydrated lime	58,226	56,960
Total	393,955	374,085
Refractory (dead-burned dolomite)	175,804	165,425

*Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

Dust Control

SOLVAY PROCESS DIVISION, Allied Chemical and Dye Corp., Syracuse, N.Y., as a part of its expansion and improvement program, is installing \$350,000 worth of equipment designed to improve dust conditions at its Solvay lime plant.

The first of several steps in the program involved changes at the Jamesville quarry designed to reduce the amount of fines delivered to the plant with the limestone. The second step involves installation of new equipment at the kilns. This phase of the program is expected to be completed within 1-1½ years.

Rocky's Notes

(Continued from page 81)

Mr. Baker's address, is to find some way to interest labor leadership in the problems of the economic stability as a whole. Herbert Hoover has said that when he was President he would have made John L. Lewis Secretary of Labor, if he could have. We probably have never had a President who was a better judge of other men's capacity than Mr. Hoover, or one who was less influenced in selecting assistants by political considerations. He knew that John L. Lewis is an extremely capable man, and that in a different environment, in a position of public trust, he would probably have been a good and faithful public servant.

The point is, that labor unions do produce capable leaders, men fully able to understand the economic laws under which our economy must function. The problem is to weave them into our industrial structure so that their talents for leadership may be utilized to the best interests of all of us—and in the end as much or more to the membership of their unions. Of course, such public service is not to be expected from ignorant and arrogant politicians who in many instances are at present in the drivers' seats. But they will pass, just as the arrogant and unprincipled autocrats of industrial management have passed on, or are rapidly passing on. It is not to be expected that the rank and file of labor will be won over to an understanding and observance of economic laws until these are made clear to them by their own leaders. If we are going to continue under American institutions as we have and are trying to do now, this is the only way. We believe that the man who works for wages or salary is just as much wedded to our American way of life as any one else. He is misguided either by ignorant or pusillanimous leadership, of which in time he will become aware.

On the other hand, management also will have to make some advances. It will have to recognize organized labor as at least an indirect shareholder in its enterprises. Management must come sooner or later to the point where it will want to share the responsibility for an enterprise's solvency and prosperity with its employees. They will be at least equal losers with other shareholders, if an enterprise collapses, because with its collapse is likely to go their pensions, insurance and all "the fringe benefits" they are now fighting so hard to get into their contracts.

Then, of course, there is another angle that both government politicians and labor union bosses or politicians do not talk about. If we are to continue efforts for a happy, united world, with freedom of trade and exchange, this country can not continue to get so far out of line

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"ACS Series"
Made in 4 sizes
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Capacity to 250
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Front Feed — For
minimum of fines.

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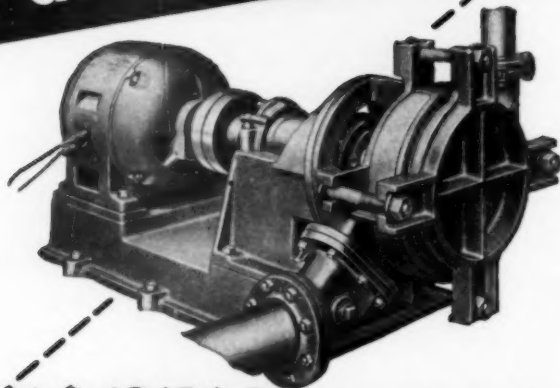
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MORRIS TYPE "R" SLURRY PUMPS

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1. The gland is under suction pressure only.

Unlike conventional pumps, the packing in the Morris Type "R" is under suction or positive head pressures only. It handles suction lifts with a hub sealing pressure of 2 or 3 psi. Under positive head, the pressure on the hub sealing ring need not be greater than the head at the intake.

Operation under low pressures reduces wear and tear of abrasive solids . . . practically eliminates packing troubles.

2. Easily dismantled by loosening four bolts.

To remove the impeller, simply loosen four bolts, slip them out of disc slots and pull off end cover. Suction and discharge piping remains undisturbed . . . and the impeller comes out by threading it off the shaft.

Worn clearances on suction side of impeller are easily closed by tightening four adjusting screws.

3. Shell interchangeable for right or left hand rotation.

Suction and discharge nozzles can be rotated around axis of pump to positions in any of the four quadrants. All together, there are 72 different nozzle locations.

4. No internal studs or bolts. No troublesome internal fits and joints.

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The experience of 83 years in the designing and building of pumps is at your disposal. Let our engineers help you select the exactly right pump for your particular needs. No charge or obligation.

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MORRIS Centrifugal Pumps

economically that it can no longer compete in the world's markets. That day is approaching rapidly. It would probably be here now if we were not supplying the money or credit with which our foreign customers buy our products. Already, there is pressure being brought upon the Congress to reinstate protective tariffs on numerous commodities, which foreign producers and manufacturers can supply at much less cost than we can produce them here. In a world economy, which our politicians are clamoring for, this country can not forever ignore the natural laws that such an economy involves.

Labor Relations Trends

(Continued from page 83)

(1946): 'This does not require the employe to be directly 'engaged in commerce' among the several states. This does not require the employe to be employed even in the production of an article which *itself* becomes the subject of commerce or transportation among the several states. It is enough that the employe be employed, for example, in an occupation which is necessary to the production of a part of any other 'articles or subjects of commerce of any character' which are produced for trade, commerce or transportation among the several states.'

"The Supreme Court has also held: 'Vehicular roads and bridges are as indispensable to the interstate movement of persons and goods as railroad tracks and bridges are to interstate transportation by rail. If they are used by persons and goods passing between the various states, they are instrumentalities of interstate commerce.' *Overstreet vs. North Shore Corp.*, 318 U.S. 125, 129 (1943).

Production for Commerce

"Applying these principles, we are of the opinion that Alstate's off-the-road employes, in producing material which is used to repair and maintain the surfaces of instrumentalities of commerce, are engaged 'in the production of goods for commerce'. The same rationale was employed by the Court of Appeals for the Fifth Circuit in *Atlantic Co. vs. Walling*, 131 F. 2d 518 (1942), in holding that the act applied to employes who manufactured ice to refrigerate railroad cars transporting other commodities in interstate commerce, the ice being consumed in transit; and in *Lewis vs. Florida Power & Light Co.*, 154 F. 2d 751 (1946), in which it was held that an employer engaged in the production of goods for commerce by furnishing electricity to others who used it to transmit interstate messages and in the operation of interstate facilities.

"With respect to Alstate's contention that the sweep of the injunction is too broad in that it covers all of Alstate's employes, including those

engaged in original construction and private projects unconnected with interstate commerce, it is answered by the very language of the injunction. The latter applies only to those 'engaged in interstate commerce, within the meaning of the act.' The district court found that during the period involved, none of Alstate's work on interstate facilities involved original construction, and that there was no segregation of work performed by the off-the-road employees. In doing so it specifically held, and properly so, that 'original construction is definitely beyond the contemplation of the act.' As long as any individual employee spends a substantial part of the work-week in commerce or in the production of goods for commerce, he is entitled to the full benefits of the act. At present, all of Alstate's employees fall into this category.

"For the reasons stated, the judgment of the district court will be affirmed."

Anti-Union Operator

Another Pennsylvania case of a different nature was decided by the Pennsylvania Supreme Court, Eastern District, March 24, 1952. This involved the discharge of union employees by an "equipment superintendent." The question before the court was whether they were discharged for cause, or because of union activities. The action was brought under a Pennsylvania state law which parallels the N.L.R.A. A part of the court's decision follows:

"In the instant case, therefore, our inquiry is not whether the equipment superintendent had actual authority from the proprietor to make the statements which he did, but only whether he acted 'directly or indirectly, in the interest of an employer.' In this connection it is pertinent to note that the superintendent's position was supervisory in nature. Appellee described it thus: 'We designated him as superintendent . . . he sees that all the repairs are done; prepares various work schedules and sees that they are done . . . He generally interviews the men that come in for jobs.'

"Perhaps the best indication of the nature of the relationship between him and the other workers comes from his own testimony: 'The fellows complained so I switched them from one job to the other so that the drivers would not complain to me about my keeping them under the shovel all the time. I told the boys they had to work any place I put them and they had to work under the shovel.'

"There can be no doubt that a man endowed with such authority was speaking 'in the interest of' his employer when he told the men that a union would not be tolerated. It is therefore unnecessary for us to probe the niceties of the law of agency and decide whether this superintendent had actual authority from the pro-

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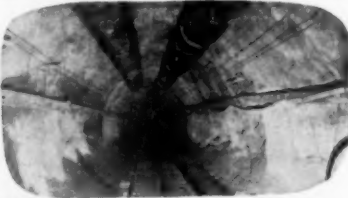
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CONSTRUCTIVE SUGGESTIONS

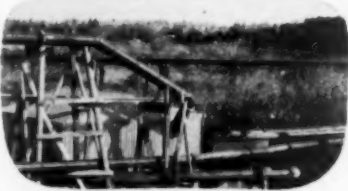
Typical Ways in Which NAYLOR Light-weight PIPE Serves Mining Engineers



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prietor or whether he in fact transmitted his knowledge of union activities to the proprietor. Within the meaning of the statute, the superintendent's words were the words of the employer.

"His anti-union expressions, taken together with appellee's unconvincing attempt to establish that the work of these employees had been unsatisfactory and the extraordinary coincidence that their discharge came the day after they had associated themselves with the union, were ample evidence to support the board's findings. It is immaterial that the court below might have reached a different conclusion from an independent examination of the testimony."

Agstone by Wet Process

(Continued from page 100)

has been made for five separate recovery piles. The piles are slightly curved to fit into the area. Over the approximate centerline of each pile a 10-in. dia. pipeline has been constructed which is permanently mounted about 20 ft. above the ground. It is 500 to 600 ft. long. There are holes in it similar to those previously described, along with bands for each hole. At the start of operations a



One of the tripods used to support the pipeline; on either side can be seen the steel bands and plugs which close the openings in the pipe

dike is thrown up surrounding an area about 50 ft. wide and the length of the pipeline. Mill pulp is pumped into the upper end of the line and allowed to pass through opened orifices and fall within the dammed area. The coarse, heavier solids settle out rapidly and some of the very fine material flows to the lower end of the dammed area where it flows out through a pipe through the dam and into a centrifugal pump for transfer to the regular tailings pile. Behind the dam there is no settling pond as such and the solids settle out enroute. When the pile has been built up to the feed pipeline it is allowed to drain and air dry before being mechanically loaded by clamshell to open gondola cars. There are five of these agstone storage piles with two parallel railroad tracks between each pile. One track is for the railroad cars and the

other for the loading crane. These agstone piles have a combined storage capacity of approximately 400,000 tons and are insurance against peak demands in spring and fall. A portable sloping coarse mesh screen is placed on top of the railroad cars before loading. This breaks up any lumps of agstone that might be in the embanked material.

N. A. Stockett has general supervision of all the milling operations for the St. Joseph Lead Co. in the Missouri area. His office is at Bonne Terre, Mo. H. R. Stahl is mill superintendent and K. B. Hall is assistant mill superintendent of the Federal mill, with headquarters at Flat River, Mo.

Packing Terminal

(Continued from page 116)

sections, a portable section 20 in. wide and 10 ft. long which extends into the cars and an inclined section operating at 70 deg. slope which is 24 in. wide and 16 ft. 8 in. long. The inclined section consists of two parallel sets of springs and rollers between which the bundles of sacks are transported.

Electrical power is supplied to the terminal at 13,200 volts which is reduced to 440 volts by two Allis-Chalmers 750 kv.-a. load center units substations in the packhouse and one 500 kv.-a. unit substation in the unloading station at the dock.

Personnel

C. K. Boettcher is chairman of the board of directors, Cris Dobbins is president, and M. O. Matthews is executive vice-president of Ideal Cement Co.

The operation of the Ideal plants and the terminal is under the direction of Thomas B. Douglas, general superintendent. The terminal was designed by Ideal's engineering department under the supervision of George Wiley, and it was constructed by J. T. McDowell and Sons, Denver, Colo. A. L. Moss is superintendent of the terminal.

Potash Processing Plant

DUVAL SULPHUR & POTASH Co. recently began production of potash at its new \$8,500,000 mining and refining facilities near Carlsbad, N.M. Annual production is expected to be approximately 700,000 tons.

Israel Equipment Exposition

MANUFACTURERS are now being invited to exhibit at the "Conquest of the Desert" International Exhibition and Fair to be held in Jerusalem, Israel, April 16 to May 18, 1953. The government sponsored exposition will feature commercial exhibits of equipment in various industries, including building materials, construction equipment and cement manufacturing equipment.

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Safety "FIST GRIP" Wire Rope Clips . . . Fool proof, easy to install. Fist Grip clips hold rope more securely, can't go on wrong. Fewer clips are required than for ordinary types, and they will not crush or distort the rope.

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THE MOST COMPLETE LINE OF DROP FORGED WIRE ROPE AND CHAIN FITTINGS



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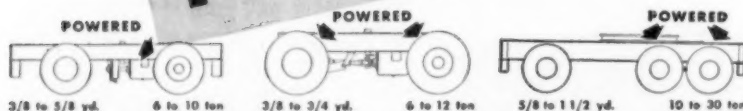
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Stone Sizes

(Continued from page 112)

a second apron feeder (and truck hopper) has been provided for feeding the secondary crushing unit. At the time of inspection plans were moving ahead for the installation of a belt conveyor and another scalper screen that would pick up the discharge from the primary crusher and scalp out a coarse rock as an additional source of riprap, or for preparation of kiln stone. The plant is shipping 12 carloads of riprap per day. The company has 12 trucks in service at the quarry, all rated between 2-5 tons capacity. Three are KB-12 Internationals and the rest are cab-over-engine Chevrolets.

The St. Clair Lime Co. office is at Sallisaw, Okla. R. C. Williams is manager and R. K. Snow is superintendent of the quarry and rock processing operations. Ralph Shipman is plant foreman and master mechanic.

Canadian Cement

PRODUCTION OF PORTLAND CEMENT in Canada for the first quarter of 1952 totaled 4,223,000 bbl. as reported by the Dominion Bureau of Statistics. This compared with an output of 3,911,000 bbl. for the same quarter of the preceding year. Shipments increased from 3,227,000 bbl. in the first quarter of 1951, to 3,527,000 bbl. in the first quarter of 1952.

Lightweight Aggregates

GEORGIA LIGHTWEIGHT AGGREGATE Co. is a new company recently organized at Rockmart, Ga., by local capital, for the purpose of utilizing the large deposits of slate in Polk county, Ga. The company owns over 300 acres of slate deposits which were formerly used in the manufacture of roofing materials, an industry abandoned in recent years.

Tests by the Bureau of Mines, the Georgia Geological Department and by private organizations indicated that the slate would be suitable as a lightweight aggregate material. The company is installing two 8- x 125-ft. rotary kilns. Capacity at the new plant will be approximately 10-12 carloads of aggregate per day.

The Rockmart plant, approximately 40 miles from Atlanta, is the only lightweight aggregate plant in that area and is on the main line of the Seaboard Air Line Railway. Officers of the company are Robert L. MacDougald, president; R. F. Holohan, vice-president; Alex MacDougald, chairman of the board; and Gilmer MacDougald, secretary-treasurer.

Gravel Plant

FARMINGTON SAND AND GRAVEL Co. recently began operations at its new plant near Farmington, N.M. The plant is owned and operated by Mr. & Mrs. Jack Walker.

Gypsum Production Sets Record

PRODUCTION OF GYPSUM and gypsum products in 1950 set new all-time records in nearly every category, as reported by the Bureau of Mines in its 1950 "Minerals Yearbook." Domestic production of 8,192,625 short tons of crude gypsum was 13 percent above the previous record year of 1948, and 24 percent greater than in 1949. A total of 57 mines reported output in 1950; of these, 38 were open-pit operations, 15 were underground mines and four were combination pit-underground mines.

Calcined gypsum production totaled 7,341,024 tons, which was 27 percent above the 1949 figure and 18 percent above that of 1948. The calcined gypsum which included both domestic and imported raw material, came from 51 plants, using 221 pieces of calcining equipment.

Imports of crude gypsum into the United States increased to 3,190,600 short tons, of which 93 percent came from Canada. An increased tonnage also came from Mexico, and Jamaica, for the first time, exported a considerable quantity to this country.

Consumption

The construction boom in 1950 created a vigorous demand for all building materials, including gypsum products. During the first nine months, non-farm housing unit starts were far ahead of similar periods of preceding years and, by middle and late summer, local shortages of various gypsum products, especially board and lath, were noted. This high level of housing starts tapered off in the latter months of 1950 and supply began to catch up with demand. The total building uses, in dollar value, were 31 percent above 1949 and 17 percent above 1948.

Plant Developments

Although many new production facilities were in operation, shortages of some gypsum building products were reported to have delayed completion of dwelling units in some areas and to have slowed the start of others. To meet unusual demands, many plants rushed through expansion and improvement plans.

The capacity of U.S. Gypsum Co.'s Jacksonville, Fla., plant was doubled during the year, as was its Fort Dodge, Iowa, plant which produces wallboard, plaster, plaster base, sheathing and other building materials. U.S. Gypsum also expanded facilities at its Sweetwater, Texas, plant, at a cost of approximately \$1,000,000.

National Gypsum Co., Buffalo, N.Y., embarked on a \$1,000,000 expansion program, which included new warehouses at its plants at Clarence Center, N.Y., and National City, Mich.

Other construction activities in 1950 included Certain-Teed Product

Check St. Paul's new line before you buy any hoist!



**4 NEW
STANDARD-DUTY
MODELS!**
6 to 10-ton capacity

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HEAVY-DUTY
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- Up to 22% more pay-load capacity per dollar
- 1" to 1 1/2" lower mounting
- New uni-flex sub-frame
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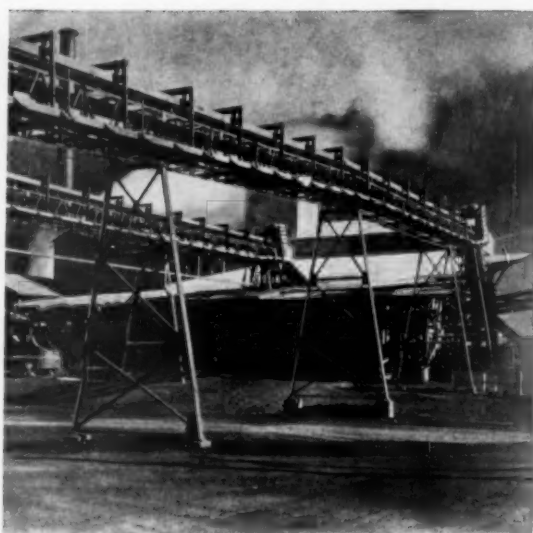
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The HEWITT-ROBINS SECTIONAL BELT CONVEYOR

Easy to Assemble

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Here is the complete belt conveyor that will meet the requirements of both small and large operators handling bulk materials.

Easy to Assemble: Your own men can assemble, disassemble, move, extend or shorten it quickly and easily.

Take Your Choice: Select the right belt conveyor to fit your own particular needs—you have a choice of 3 types of drives—wide selection of intermediate truss lengths—your choice of idlers—(4", 5" or 6" diam.)—4 belt widths (18", 24", 30" or 36") in lengths up to belting limitations.

Factory-Assembled Units: All truss side members are factory-welded as complete units and are jig-drilled for easy erection—head and tail units completely assembled with machinery in place.

Standard Equipment: Self-cleaning, protective decking for return strand supplied for the entire conveyor line.

Optional Equipment: Hood covers—easily attached loading hopper.

Only Hewitt-Robins is able to take single unified responsibility for a belt conveyor installation—only Hewitt-Robins manufactures both machinery and belt.

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HEWITT-ROBINS  **INCORPORATED**
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Corp.'s new gypsum board plant at Fort Dodge, Iowa, and Columbia Gypsum Co.'s new plaster and agricultural gypsum plant at Greenacres, Wash. Kaiser Gypsum, a division of Kaiser Industries, Inc., Oakland, Calif., announced that it would operate the Standard Gypsum plant at Long Beach, Calif., and also a gypsum-manufacturing unit at Redwood City, Calif. Certain-Teed Products Corp. acquired the Phoenix, Ariz., plant of Union Gypsum Co. and announced plans to build a gypsum wallboard and lath plant and also to enlarge existing facilities. Ceolotex Corp., Chicago, Ill., acquired the plaster and gypsum deposits of Wasem Plaster Co., Fort Dodge, Iowa.

Prices

As reported to the Bureau of Mines by producers, the average value of crude gypsum mined was \$2.78 per ton in 1950, compared with \$2.77 in 1949. Among uncalcined uses, the unit values of portland cement retarder (\$3.23 per ton) and agricultural gypsum (\$4.28 per ton) also remained virtually unchanged from 1949. The values of industrial gypsum products showed minor gains. Sanded plaster, with an increase of 20 percent in value, showed the highest gain.

Gypsum products (made from domestic, imported and by-product crude gypsum) sold or used in the United States, 1949-1950, according to uses, was listed by the Bureau of Mines as follows:

Use	Short tons	
	1950	1949
Uncalcined:		
Portland cement retarder	1,720,936	1,528,440
Agricultural gypsum	465,359	425,646
Other uses	31,991	35,897
Industrial:		
Plate glass and terra cotta plasters	63,727	48,159
Pottery plasters	49,748	42,784
Orthopedic and dental plasters	10,758	9,798
Other industrial uses	141,959	110,954
Building:		
Plasters:		
Base coat	2,334,656	1,824,790
Sanded	125,948	112,875
To mixing plants	16,073	17,964
Gaging and molding	219,417	179,875
Prepared finishes	19,659	19,388
Other	168,065	125,407
Keene's cement	57,797	44,624
Prefabricated:		
Lath	2,131,466	1,519,776
Wallboard and laminated board	2,551,653	2,036,548
Sheathing board	121,321	102,525
Tile	257,556	163,587

Potash

SOUTHWEST POTASH CORP., subsidiary of American Metal Co., Ltd., is scheduled to begin mining operations at its large potash deposit near Carlsbad, N.M., sometime in August. Plant construction and other surface installations, and the sinking of shafts have been completed. Annual production is expected to be approximately 185,000 tons.

Pozzolanic Materials

ROCK MATERIALS ASSOCIATED, Salt Lake City, Utah, in seeking sources of fine pozzolanic materials in their natural state, has found material on two properties, one in Idaho and the other in Utah.

The deposit in Idaho is a white pumicite of a fineness of 93 percent through a 325-mesh screen after passage through a hammermill. The material found in Utah is white to a deep yellow cream color, a high-silica clay of which 98 percent passes a minus 325-mesh screen after one impact of the mill hammers. Both materials are said to be highly pozzolanic and their fines range from 325 mesh to micron sizes. Experiments have indicated the Utah material to be an excellent plasticizer for cement mixtures. The average mineral compositions of the two materials are as follows:

	White pumicite	Cream-colored clay
Silica	71.0 percent	79.8 percent
Alumina	15.0 percent	6.5 percent
Iron oxide	2.0 percent	3.5 percent
Lime	1.9 percent	1.7 percent
Magnesia	2.0 percent	0.5 percent
Sulfur	0.5 percent	2.0 percent
Ignition loss	7.0 percent	5.6 percent

Limestone Plant

ADAMS AGSTONE, INC., recently began full production at its new plant near Hanover, Penn. The new plant replaces one formerly operated by George O. Adams. The finished product is a minus 20-mesh material, with approximately 70 percent passing a 100-mesh sieve. The product is being distributed in York and Adams counties in Pennsylvania and in Carroll and Frederick counties in Maryland.

The company operates a fleet of ten spreader trucks and several tractor-trailers for delivery to dealers. George O. Adams is president of the company and H. H. Wagner is general manager.

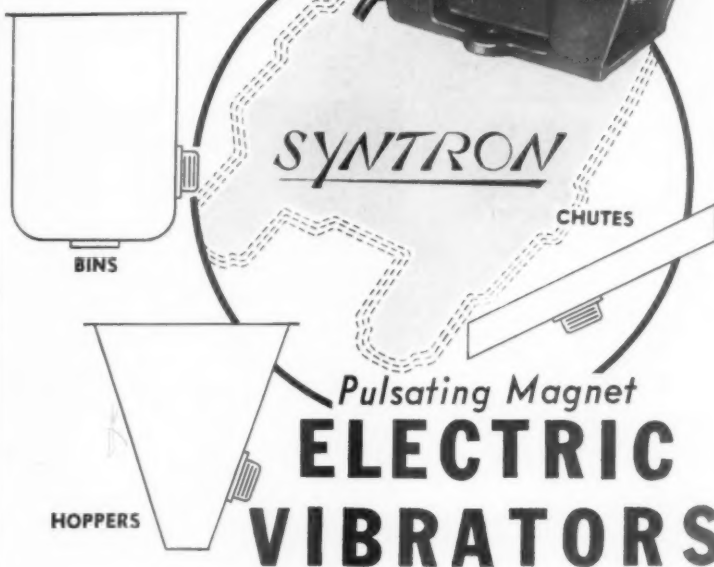
U.S. Mica Deposits

THE U. S. DEPARTMENT OF THE INTERIOR recently announced that new deposits of mica and manganese have been discovered in the United States. However, the amounts involved are not expected to affect the price of these scarce minerals, nor relieve the U.S. dependency upon foreign sources. The mica deposits were found near Franklin, N.C., and the manganese near Batesville, Ark. They are the first discovered under the government's exploration program for defense. About 95 percent of the nation's mica and about two-thirds of the manganese supply are now being imported.

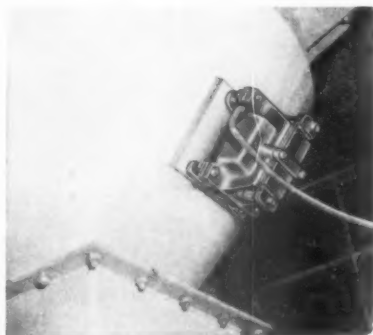
Rezoning Request Denied

AN APPLICATION by Joseph L. Strup, Kansas City, Mo., to rezone an 88-acre tract for use as a quarry was denied recently by the county planning commission. The matter had been under advisement for several months.

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Bins, Hoppers
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Hoppers: Conical; Rectangular; Parabolic; with Sloping Discharge; Vertical Side; Metal; Concrete; Wooden.

Bins: Rectangular; Cylindrical; with Flat Bottom and Center Discharge; with Hopper Bottoms.

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For smooth material flow without unscheduled stoppages due to material arching and plugging, apply Syntrol Electric Vibrators.

They work faster, easier and better than the time consuming, damaging method of hammering and prodding to open clogged bins . . . cut excessive labor and replacement costs. The right size Syntrol Vibrator properly applied sets up a flow of high speed vibrations that cause even the most stubborn material to flow freely.

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CLASS XA

— Double shell, semi-direct heat. High efficiency. For materials that can be dried in direct contact with combustion gases and heated above 212°.

CLASS XB

— For materials that must be dried by indirect heat but can be heated above 212°. A double shell dryer with low dust loss.

CLASS XC

— Steam tube dryer for materials that must be dried by indirect heat and at low temperatures, such as chemicals, grains, food products.

CLASS XF

— For direct heat drying at temperatures above 212°. A single shell counter-flow dryer that does not discharge the material through the furnace.

CLASS XH

— For direct heat drying at temperatures above 212°. A single shell parallel flow dryer designed to handle sticky materials.

CLASS XW

— For material that can be dried by hot air at temperatures below 212°. Dries ammonium nitrate; potassium chloride, etc.

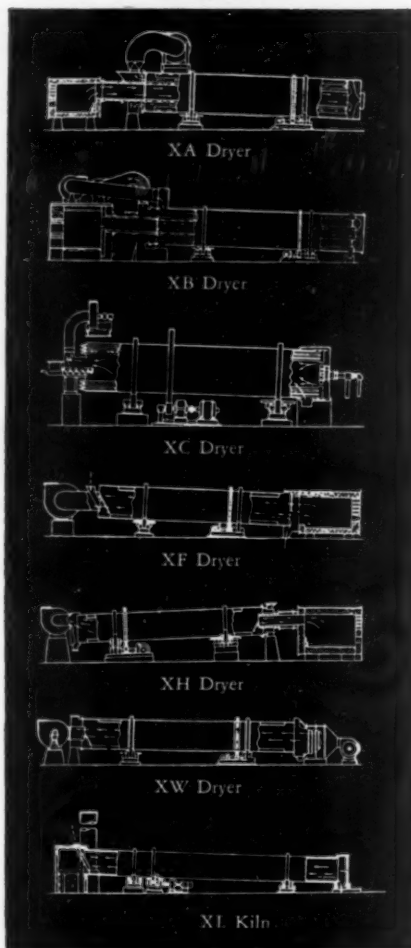
KILNS

— Rotary type for drying, calcining, roasting or oxidizing at temperatures above the range of ordinary dryers. Refractory lined.

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— Air, water spray or submerged rotary type. Each designed for the efficient cooling of materials from kilns or roasters.

Bulletin 16-D-7 describes entire Ruggles-Coles line.



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Pelletized Rubber Surfacing

GOODYEAR TIRE & RUBBER CO., Akron, Ohio, and Berry Asphalt Co. of Chicago, Ill., and Magnolia, Ark., are cooperating jointly to develop further Goodyear's pioneering work on pelletized rubber as a surfacing material for playgrounds and other installations.

The Goodyear company states that the pelletized rubber has been tested successfully over the past few years on a number of Akron, Ohio, school playgrounds. In 1949 several test areas were placed, followed in subsequent years by improvements in the material and in methods of installation.

The pelletized rubber is applied as a top dressing to asphalt surfaces, producing a resilient surface designed to reduce playground accidents. Test areas installed three years ago at the playgrounds are said to have shown little deterioration from wear, frost damage or heavy rains. The product is being marketed as "Rub-A-Mix" and is claimed to be suitable not only for playgrounds, but also as a surfacing material for walks, bridge floors, railroad crossings and other installations requiring a resilient, noiseless, waterproof and flexible surface.

In addition to the pelletized rubber program, both companies are currently engaged in the development of synthetic rubber powders for use in asphalt mixes for highway construction (see ROCK PRODUCTS, May, 1952, issue, page 79.)

Florida Minerals

FLORIDA'S VARIED MINERAL PRODUCTS sold for \$68,000,000 at the mines in 1950, a 23 percent increase over the preceding year, as reported by the Florida Chamber of Commerce. Phosphate sales, amounting to \$45,377,842, led all the rest. Crushed limestone, Florida's second ranking mineral, amounted to 5,313,400 tons, valued at \$6,885,394. Sand and gravel production totaled 2,793,865 tons, valued at \$2,806,431. The production of clays, including fuller's earth, totaled 210,842 tons, with sales of \$2,017,634. Sales of other minerals, including cement, lime, ilmenite, calcareous marl, rutile, zircon, flint, dimensional stone and petroleum, totaled \$10,600,000.

Phosphate Drilling

AMCO EXPLORATION, INC., subsidiary of American Metal Co., Ltd., is planning to conduct exploratory drilling in Duval county, Fla., for the purpose of locating profitable phosphate deposits. A report of the company's findings will be published by the Florida State Geological Survey.

Buys Gravel Plant

WALTER D. PETT, Eagle, Wis., recently purchased the Eagle Sand and Gravel Co. plant from Hayden Krause, Palmyra, Wis.

New Incorporations

Umbreit-Gross Sand & Supply Co., Milwaukee, Wis., was recently incorporated by George C. Lord, Loren A. Umbreit and Eugene W. Grosse with 600 shares of no par value stock and a minimum capital of \$500.

Greenbank Sand & Gravel Co., Barberton, Ohio, was recently issued a corporation charter. Stock issued includes 600 shares "A" and 600 shares "B" no par common stock and 250 shares preferred stock, \$100 par value. S. C. Andress, G. W. Rooney and Esther Coorsh are the incorporators.

Central Concrete & Materials Co., Milwaukee, Wis., has been incorporated with 400 shares of stock and a minimum capital of \$20,000. The incorporators are B. C. Froemming, C. L. Herdler and H. C. Bartelt.

Gainesville Concrete Co., Gainesville, Texas, has been incorporated by A. J. Maxwell, Mrs. Othello Maxwell and John B. Lawrence. Capital stock was listed at \$5000.

Steneman Concrete Products, Inc., Roberts, Wis., has been incorporated with 500 shares of stock, no par value. Minimum capital was listed as \$25,000. The incorporators are Emil F., Roland E. and Walter J. Steneman.

Pre-Cast Concrete Products Corp., Madison, Wis., was recently incorporated with 150 shares of common stock, par value, \$100, and 100 shares of preferred stock, par value, \$100. Minimum capital is \$500. L. L. Miller was listed as the incorporator and Norris E. Maloney as registered agent.

Greenwood Brickerete, Inc., Columbia, S.C., was recently granted articles of incorporation. Capitalization was listed as \$25,000. The firm, which will deal in masonry products, is headed by S. A. Agnew.

North Arkansas Lime Products, Inc., Harrison, Ark., has been granted a charter, listing authorized capital of 1000 shares of stock, no par value. The incorporators are David and Carolyn Ray and Delton and Margaret Houston.

Kubiak Concrete Products Co., Buffalo, N.Y., has been incorporated by Lottie C., Richard and Karl Kubiak.

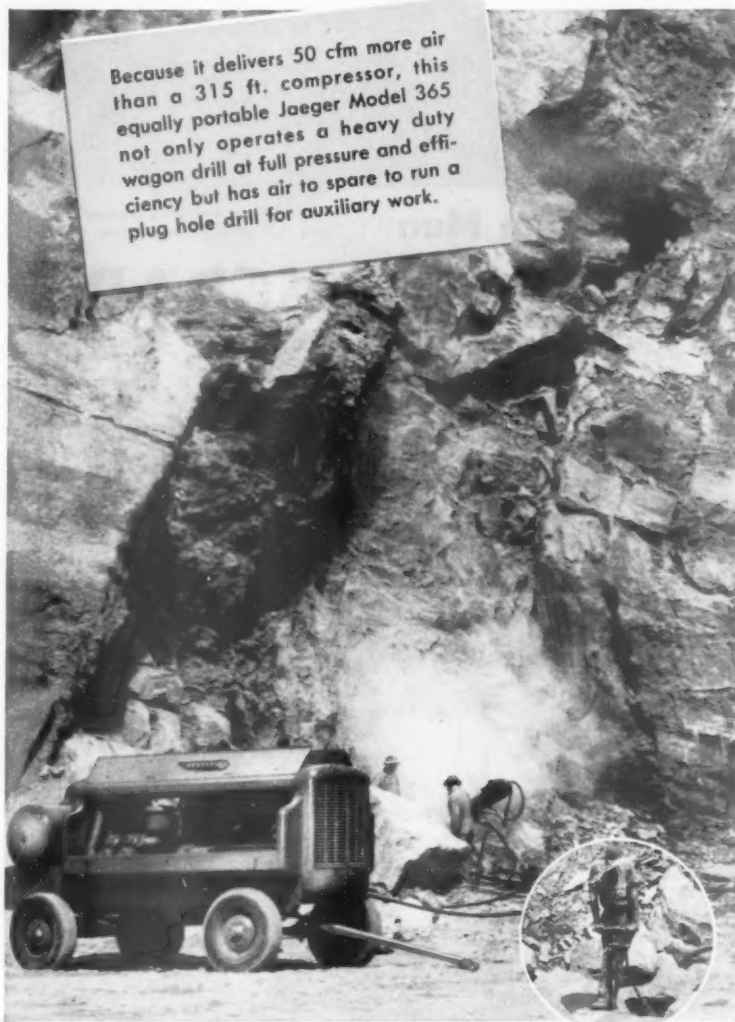
Frontier Dolomite Concrete Products Corp., Lockport, N.Y., has been incorporated with a capital of \$100,000. The incorporators are Myron J. and Emma C. Wurttenberger and James W. Switzer.

Lightweight Aggregates, Inc., Rapid City, S.D., was recently incorporated with a listed capital of \$100,000. The firm will produce lightweight aggregates for concrete block and other building materials. The directors are R. E. Lemley, M. B. Christie, Ralph R. Basler, R. E. Driscoll and P. R. Quarnberg.

Little Wheel Sand & Gravel Co., Tucson, Ariz., has been incorporated by Albert Scott.

Jaeger "air plus" means 15% to 25% more air from portable compressors

Because it delivers 50 cfm more air than a 315 ft. compressor, this equally portable Jaeger Model 365 not only operates a heavy duty wagon drill at full pressure and efficiency but has air to spare to run a plug hole drill for auxiliary work.



As compact and portable as compressors of much less capacity, Jaeger Air Plus units produce, at the rock face, the air you need to operate your drills at full efficiency. Model 250 fully powers 2 heavy rock drills. Model 365 fully powers 3 heavy rock drills or one heavy wagon drill plus a plug hole drill. Model 600, introduced by Jaeger, was the first to run 2 heavy wagon drills efficiently. For increased production with low cost air power, see your Jaeger distributor or send for Catalog JC-1.

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Above—Sauerman Drag Scraper cuts deep into hill and moves gravel to crusher

SAUERMAN SCRAPER



Sauerman Crescent "scoop" digging its load at top of hill for haulage to crusher at base of slope.



Here is a Sauerman Crescent scoop equipped with a trolley carrier for a track cable scraper installation. This type of installation, with the head end elevated considerably above the tail end, permits gravity return of the empty scoop from dumping point to digging point.

Why complicate what should be—and can be—a simple job? All you need to move material quicker, at lower cost, is an efficient Sauerman Scraper machine—the heart of which is the uniquely shaped Crescent scoop. The patented design of this bottomless "bucket" permits faster loading to capacity . . . smooth travel of load across the ground . . . clean, automatic dumping at discharge point.

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MANUFACTURERS NEWS

H. K. Porter Co., Inc., Pittsburgh, Penn., announces that a new branch warehouse and sales office has been opened by Quaker Rubber Corp. in Kearney, N.J., under the supervision of A. H. Smith, district manager for the New York area.

Air Reduction Co., Inc., New York, N.Y., has announced the election of George V. Slottman as a vice-president in addition to his duties as director of research and engineering.

The Yale & Towne Mfg. Co., Philadelphia, Penn., has appointed O. S. Carliss as director of engineering, and George F. Quayle as assistant director of engineering. Mr. Carliss succeeds Charles S. Schroeder who has been named director of the research and development division. Mr. Quayle replaces Frank A. Vossenbergh who has been made assistant director of the division.

Le Roi Co., Cleveland, Ohio announces that Jack Feucht has been appointed chief engineer of the Cleveland Rock Drill division, and Theodore Schmidt has been named assistant chief engineer.

The American Pulley Co., Philadelphia, Penn., announces that Charles E. Bain, Jr., has been appointed manager of manufacturing. He was formerly production manager of F. J. Stokes Machine Works, Philadelphia.

Wall Colmonoy Corp., Detroit, Mich., has announced the appointment of Anthony J. Allen as Eastern sales manager with headquarters in New York. He will be in charge of sales on the Eastern Seaboard.

Pennsylvania Crusher Co., Philadelphia, Penn., announces that Edwin H. Keiper has been made chief engineer.

Westinghouse Electric Corp., Pittsburgh, Penn., has announced the appointment of W. W. Sproul as vice-president in charge of the general industrial products group of divisions. L. B. McCully has been named vice-president in charge of the East Pittsburgh divisions, and H. E. Seim has been made vice-president in charge of the Sturtevant division, with headquarters at Boston, Mass.

Bucyrus-Erie Co., South Milwaukee, Wis., has announced the election of W. L. Little as president and member of the executive committee. Mr. Little, who has been associated with Bucyrus-Erie or its predecessors for 26 years, has been executive vice-president since 1950. He was manager of the Erie, Penn., works for almost 20 years. He became vice-president in 1943 and executive vice-president in 1950. He has been a member of the board since 1947. Other officers elected are W. W. Coleman, chairman; N. R. Knox, vice-chairman; P. H. Birkhead, vice-president; R. W. Newberry, vice-president; C. K. Charlton, vice-president; P. S. Stevens, vice-president; M. T. Smith, vice-presi-

dent; L. S. Cline, secretary; and F. C. Weiblen, treasurer. D. P. Eells has retired as a director after 45 years of service with the company, and P. H. Birkhead, vice-president in charge of sales, has been named to fill the vacancy. J. G. Miller, secretary and treasurer, who has been associated with the company for 44 years, has also retired.

Western Machinery Co., San Francisco, Calif., has announced the appointment of Cyril S. Kranick as sales engineer for the New England and Middle Atlantic states, with headquarters in Dunmore, Penn.

Chain Belt Co., Milwaukee, Wis., is now occupying its new administration building at 4701 W. Greenfield Ave. For the past 50 years, the firm had its executive headquarters at 1600 W. Bruce St., Milwaukee.

The Buda Co., Harvey, Ill., has appointed J. C. Baseheart as general sales manager of the engine division,



J. C. Baseheart

according to an announcement by L. F. Shoemaker, vice-president. Mr. Baseheart, associated with the company for 26 years, was transferred to the Harvey office in 1951 as sales manager after serving 11 years as president of Buda Engine & Equipment Co., Dallas, Texas. Previous to this, Mr. Baseheart was transferred to the oil field division in 1929 and appointed manager of the division in 1935. Since joining Buda in 1926, Mr. Baseheart has served in various departments of the company, including the service department as a service engineer in the Eastern territory.

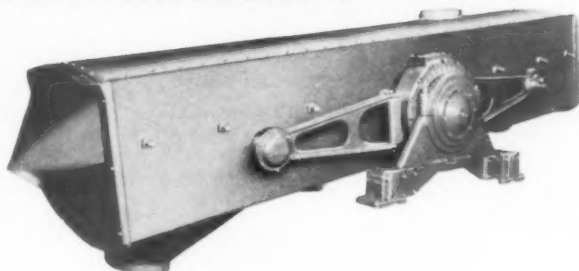
American Wheelabrator & Equipment Corp., Mishawaka, Ind., has announced the appointment of W. S. Schamel, formerly sales engineer, as assistant technical director. G. W. Roper, J. K. Davidson and F. A. Lindahl have been named project engineers. W. G. Carrie, W. H. Williamson and F. R. Culhane have joined the staff as project engineers.

A. O. Smith Corp., Milwaukee, Wis., announces that Will Cain has been appointed New Orleans sales representative. He was formerly sales engineer in the Houston office.

Worthington Corp., Harrison, N.J., has appointed J. R. Hutchison as regional manager for the Middle East, which comprises Cyprus, Egypt, Greece, Iran, Iraq, Israel, Lebanon, Syria, Trans-Jordan and Turkey. Mr. Hutchison, who has recently served as compressor specialist in the export department, will make his headquarters in Istanbul, Turkey.

Tractomotive Corp., Deerfield, Ill., announces the death of V. M. Dobeus, president and general manager, at Billings Memorial Hospital, Chicago,

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SPECIAL FEATURES

- **Selective Throw:** 8 vibration adjustments, easily changed in field.
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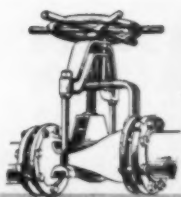
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Recesses molded into sides of sleeve act as "hinges" during compression, eliminating excessive strain and wear. These valves have been used successfully for many years by various industries, wherever there is a problem of transporting abrasive or corrosive pulps or liquids. Here are some of the other proved advantages of these valves:

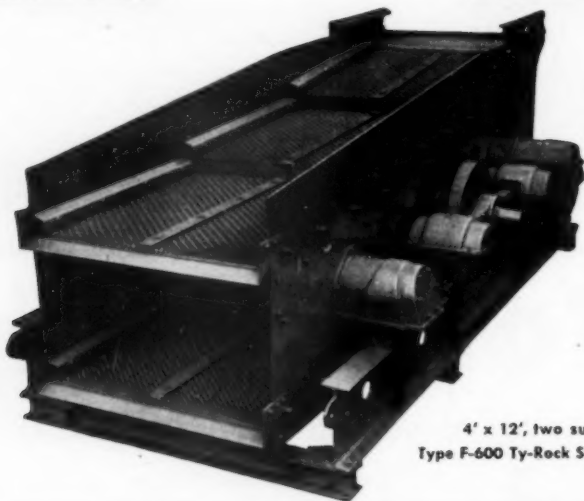
- Long Life Under Severe Conditions
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- Only ONE Wearing Part
 - Withstands All Chemicals Not Harmful to Rubber or Neoprene
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 - Withstands pressures up to 150 psi.

New free CATALOG gives complete information on Masco-Grigsby Rubber Pinch Valves; Marcy grinding mills for laboratory, pilot plant and commercial grinding; laboratory crushers and pulverizers.

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THE W. S. TYLER COMPANY

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Manufacturers of Woven Wire Screens and Screening Machinery

April 8. He was 50 years old. Mr. Dobeus and Paul B. Cochran founded the company at Findlay, Ohio, in September, 1945. He became sole owner shortly after the firm moved to Deerfield in 1948. Prior to forming Tractomotive, Mr. Dobeus was chief engineer at the Springfield, Ill., works of the tractor division of Allis-Chalmers Mfg. Co.

General Industrial Equipment Div. of the N.P.A., Department of Commerce, Washington, D.C., has made the following announcement: Joe H. Peritz of Syracuse, N.Y., chief of the materials handling equipment branch, who has been with the N.P.A. since November, 1950, has joined the sales department of Clark Equipment Co. at Battle Creek, Mich. Succeeding Mr. Peritz is Robert W. Scott of Portland, Ore., who has been chief of the industrial truck section. He was formerly parts and service manager of the Hyster Co. of Portland. The new chief of the industrial truck section is Carl Duckwitz of Philadelphia, who formerly was sales manager for one of the jobbers of the Clark Equipment Co. C. G. Hawley, formerly with Jeffrey Mfg. Co., Columbus, Ohio, is serving as chief of the conveyor section.

Hyster Co., Portland, Ore., has appointed Industrial Handling Equipment Co., Cincinnati, Ohio, as sales representative in southern Ohio, parts of Indiana and Kentucky, including the counties of Muskingum, Perry, Hocking, Mercer, Darke, Preble, Butler, Hamilton, Auglaize, Shelby, Miami, Montgomery, Warren, Clermont, Clinton, Green, Clark, Champaign, Logan, Union, Brown, Madison, Fayette, Highland, Adams, Delaware, Franklin, Ross, Pickaway, Licking, Barefield in Ohio; Franklin, Ripley, Dearborn, and Switzerland in Indiana; and Boone, Campbell and Kenton in Kentucky.

Flexible Steel Lacing Co., Chicago, Ill., has announced the appointment of Hugh L. Coats, Jr., as sales representative in the North Central states. He succeeds Harry Beach who has been assigned to the Pennsylvania-New Jersey area, which was formerly covered by Creighton L. Garesche, who has retired.

Chase Bag Co., Chicago, Ill., announces that H. E. Dennie, formerly Chicago sales representative, has been appointed sales manager of the Philadelphia branch territory. E. S. Elgin has been transferred from the Philadelphia branch to the Chicago general sales office.

Harbison-Walker Refractories Co., Pittsburgh, Penn., announces the appointment of Miro Mihelich as manager of Harbison-Walker Minerios, Ltda., a subsidiary company organized for developing sources of raw materials in Brazil.

Gar Wood Industries, Wayne, Mich., has announced the appointment of H. H. Hippler as assistant director of sales and advertising. R. F. Whit-

worth, formerly sales manager, national accounts, has been named to succeed Mr. Hippler as manager of the branch division. Ross Mill, formerly manager of the factory branch in Chicago, has been named vice-president and general manager of the National Lift Co., Waukesha, Wis., a subsidiary. R. S. Jay has been appointed sales manager of the Findlay division. He was formerly assistant sales manager in charge of Buckeye equipment and will be succeeded in this position by R. M. Steegman, formerly district manager of the Midwest. David J. Davis, who has been Southeast district manager, has been appointed assistant sales manager in charge of tractor equipment.

Blaw-Knox Co., Pittsburgh, Penn., announces that James H. Elkus has been appointed assistant manager of the Blaw-Knox division. W. J. Kal-meyer has been appointed works manager of the division.

Sterling Electric Motors, Inc., Los Angeles, Calif., has opened a sales office in Baltimore, Md., with E. Stephen Farlow as manager. Carl E. Johnson, chairman of the board, was recently awarded the Fifty-Year Certificate of the National Electrical Manufacturers' Association by the association's board of governors.

Hyster Co., Portland, Ore., has announced the appointment of Robert F. Moody as Eastern division industrial truck sales manager, with headquarters in Peoria, Ill.

Pioneer Engineering Works, Minneapolis, Minn., and Kensington Steel Co., Chicago, Ill., both subsidiaries of Poor & Co., Chicago, announce the opening of an Eastern sales office in Newark, N.J. Personnel operating out of the new office include Roger Lewis, mines and cement plant representative for Pioneer; Fred Dolton, Pioneer sales representative for New England, New York and Pennsylvania; and Wilbur Ellis, Eastern representative for Kensington.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces three 35-mm. sound filmstrips on centrifugal pumps available through the general machinery division district offices. Titles are "How and Why of Centrifugal Pumps," "Pump Maintenance," and "Covering All Angles."

Fruehauf Trailer Co., New York, N.Y., has announced the appointment of A. V. Tiee as regional manager for the West Coast; E. C. Henning as Bay area fleet sales manager; Walter Pavela as district manager for the Bay area; and John Halwax as used trailer sales manager for the West Coast.

R. G. LeTourneau, Inc., Peoria, Ill., has appointed the Rocky Mountain Machinery Co., Salt Lake City, Utah, as distributor for the state of Utah, three counties in Wyoming and 13 counties in Idaho.

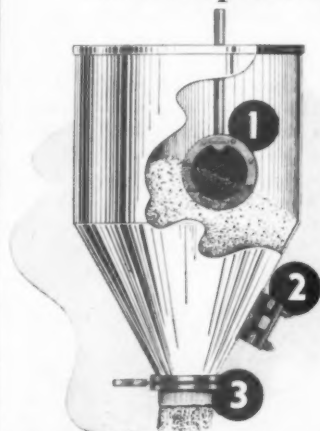
Westinghouse Electric Corp., Pittsburgh, Penn., has appointed James

for Complete Hopper Efficiency—

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1. Hopper Level Switches

Eliminate spillage and shortage of materials. Automatically maintain desired levels of materials—from fine to coarse—in bins and hoppers. Control feeding.



2. Electric Vibrators

Assure free-flowing bins, hoppers and chutes. Eliminate arching and plugging of materials without hammering and rodding that damages equipment and wastes manpower.

3. Flow Control Valves

Control flow of bulk materials from bins, hoppers and chutes. Rotating control lever increases or decreases opening of flexible iris type diaphragm and flow of material without jamming or clogging.

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Super Strength Parts
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For high-strength parts . . . for an extra margin of safety . . . for weight-saving sections . . . use dependable EVANSTEEL. This chrome-nickel alloy has a tensile strength after annealing that averages up to 60% greater than ordinary carbon steel.

Write for EVANSTEEL Bulletin

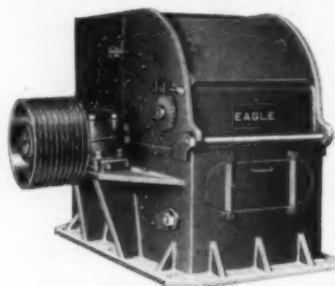
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Makers of Alloy Steel for Over 40 Years

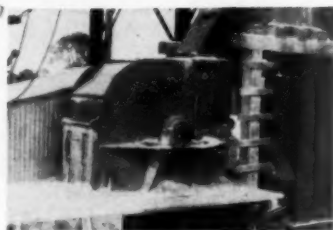


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Following the trend towards more "medium sized" equipment, this Eagle 36-42 hammermill is finding added favor with operators faced with stone reduction problems. In many cases it replaces a primary crusher—delivers uniformly good output that commands a higher price. Means more profit!

The largest in a fine performing family of EAGLE hammermills and jaw crushers, this 36-42 (shown at right) is doing yeoman work at a midwestern quarry.



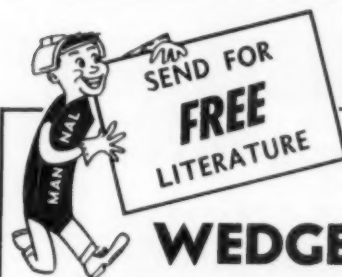
Send for Folder 251-129 and get full particulars.



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- 23 sizes available to fit any worn tooth. For greatest strength attach with Manganal Electrodes.



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R. Weaver as assistant to T. I. Phillips, vice-president in charge of manufacturing. For the past four years, Mr. Weaver has been on assignment to Baldwin-Lima-Hamilton Corp., where he served as vice-president in charge of manufacturing.

The Euclid Road Machinery Co., Cleveland, Ohio, announces that John E. Ehlert has been appointed assistant domestic sales manager. He was formerly service and parts manager and will be succeeded in this position by G. M. Perry of the sales development department. G. W. Cunnann has been appointed district manager for the Northeast territory which includes Massachusetts, Rhode Island, New Hampshire, Maine and Vermont and the Maritime Provinces of Canada.

United States Rubber Co., New York, N.Y., announces that Harry M. Frecker has been appointed manager of commodity sales for the mechanical goods division. He was formerly development manager for the Passaic plant.

Twin Disc Clutch Co., Racine, Wis., has announced the appointment of Donald E. Beaton as assistant general manager of the hydraulic division, Rockford, Ill. He was formerly associated with Thompson Products, Inc., Cleveland, Ohio, as factory manager of the accessories division.

Thermoid Co., Trenton, N.J., has announced the election of Fred Matheis, Alvan Campbell, Jr., and Tharon J. Ellis as assistant vice-presidents.

Mexico Refractories Co., Mexico, Mo., has announced the appointment of P. S. Pell & Co., Ltd., Honolulu, Hawaii, as distributor of the complete Mex-R-Co line of firebrick and specialty products.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that J. D. Greensward has been appointed manager of the new apparatus department in addition to his duties as general manager of the Norwood Works.

Bemis Bro. Bag Co., St. Louis, Mo., has announced the death on March 10 of Howard Marshutz, supervisor of waterproof sales. He had been associated with the company since 1916.

Worthington Corp., Harrison, N.J., formerly Worthington Pump & Machinery Co., has re-elected its present board of directors and has voted to change the company's name to Worthington Corp.

Drill Bit & Tool Co., Midland, Penn., has appointed the following distributors: Allied Equipment, Inc., Miami, Fla.; Austin Powder Co., Cleveland, Ohio; Guyan Machinery Co., Logan, W. Va.; Mine & Mill Supply Co., Birmingham, Ala.; Schroeder Bros., Pittsburgh, Penn.; and E. F. Marsh Co., St. Louis, Mo.

The Timken Roller Bearing Co., Canton, Ohio, has announced the appointment of John F. Byrom as sales engineer, railway division, Minneapolis, Minn.

Koppers Co., Inc., Pittsburgh, Penn., has appointed Edward J. Helm as manager of the patent and development section of the engineering and construction division. For the past two years, he has been technical engineer in the sales department of the division.

Hercules Steel Products Corp., Galion, Ohio, announces that George C. McClure, executive vice-president and general manager, died suddenly at his home on April 26. He was 46 years old. Mr. McClure began his career in 1920 in the advertising department of Galion Metallic Vault Co., a division of the company, and later became purchasing agent of Hercules Steel Products Corp. In 1948 he was promoted to executive vice-president and recently was named general manager.

Raybestos-Manhattan, Inc., Passaic, N.J., has announced the appointment of Harold H. Burrows as sales manager of the industrial rubber goods sales division. Charles P. McHugh has been appointed manager of the roll covering and tank lining production departments of the Manhattan rubber division.

Barber-Colman Co., Rockford, Ill., has announced the purchase of the principal assets of Wheelco Instruments Co., Chicago, Ill., manufacturer of indicating, recording and controlling instruments. Barber-Colman has been in the automatic control field since 1926.

Bemis Bro. Bag Co., St. Louis, Mo., has announced the appointment of R. D. McAusland as director of Western operations, and F. V. Deaderick as director of Eastern operations. Mr. McAusland, who has been with Bemis for 52 years, will supervise all operations, including sales and production, of the plants at Seattle, Vancouver, San Francisco, Wilmington, Calif., and Los Angeles, and the Seattle, San Francisco and Los Angeles sales divisions. Mr. Deaderick, who has been with the company since 1918, will have similar supervision over the plants at Buffalo, Brooklyn, Norfolk and East Pepperell, Mass., and the Buffalo, Brooklyn, Norfolk, New York general and New York sugar bag sales divisions.

Koehring Co., Milwaukee, Wis., has appointed the Ruffridge-Johnson Equipment Co., Minneapolis, Minn., as distributor for the entire state of Minnesota, to succeed the Rocholt Equipment Co.

R. G. LeTourneau, Inc., Peoria, Ill., announces that R. G. LeTourneau, in company with a team of LeTourneau technicians, recently was in Liberia, West Africa, to attend inauguration ceremonies held in Monrovia, Liberia, at the personal invitation of William V. S. Tubman, president of the Republic of Liberia. Another purpose of the trip was to consult with Liberian engineers on development of roads,



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PER MAN HOUR!
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Breco Ropeways are renowned throughout the world as the best, modern method for speedy, efficient and economical handling of materials in a wide variety of industries. From the heart of great cities to tropical jungles Breco Ropeways constantly prove their adaptability and versatility under the most adverse conditions. Breco engineers and technical staff have specialized knowledge in every type of application. They will be pleased to offer specific recommendations for any installation.

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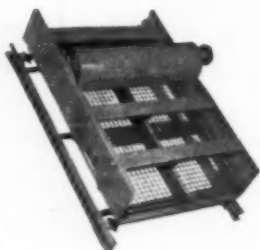
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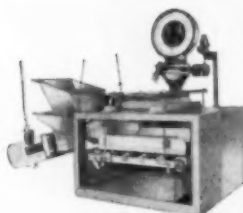
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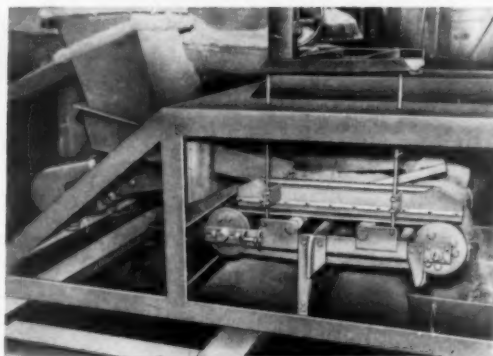
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lumber, mining and natural resources along the lines encouraged by the Point Four program of the U.S. State Department.

Chain Belt Co., Milwaukee, Wis., has announced the appointment of W. J. Sparling as vice-president and manager of the Milwaukee operations, with executive responsibility for the construction machinery, chain and power transmission, and conveyor and process equipment divisions.



W. J. Sparling

M. G. Jewett has been appointed manager of the chain and power transmission division. B. F. Devine, who has been vice-president and manager of the construction machinery division, has been made a staff officer of the company and will serve in an advisory and consulting capacity. At one time he was chairman of the Truck Mixer Manufacturers Bureau and a member of the board of directors of the National Ready Mixed Concrete Association. A. K. Thomas, formerly sales manager, has been named manager of the construction machinery division; W. A. Clayton, who has been Eastern regional sales manager since 1949, has been made sales manager; and J. W. Lendved, formerly chief engineer, has been appointed director of engineering. W. C. Messinger, formerly manager of the ordnance division, has been appointed assistant secretary of the board of directors.

Mr. Sparling, a graduate of Michigan State University, started with Chain Belt as a student engineer in 1928 and served in various executive capacities. He was vice-president and manager of the chain and transmission division prior to his present appointment.

Mr. Jewett, also a graduate of Michigan State University, joined the company in 1927 as a research engineer. He was formerly chief engineer of the chain and power transmission division.

Mr. Sparling, a graduate of Michigan State University, started with Chain Belt as a student engineer in 1928 and served in various executive capacities. He was vice-president and manager of the chain and transmission division prior to his present appointment.

Hewitt-Robins, Inc., New York, N.Y., has purchased the outstanding stock of Korb-Pettit Wire Fabrics & Iron Works, Inc., Philadelphia, Penn. H. M. Ross has been placed in charge, in addition to his duties as engineering manager of Robins Conveyors Division. The company has also acquired the plant of Micro Engineers, conveyor machinery manufacturer in Johannesburg, South Africa.


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Mo-Kan Concrete Products Association exhibit at building show



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Six Different Size Mixers

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Thousands of hours of research, engineering and development work help create the fine quality of Challenge Truck Mixers. They are manufactured on a highly efficient, mass production basis using much single purpose tooling and special automatic welding equipment designed by Challenge engineers. Made in six different sizes, Challenge offers operators their only opportunity to outfit the truck of their choice in accordance with its physical and legal payload capacity...a real money-making opportunity for EVERY ready-mixed concrete operator!

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Exclusive National Distributors for
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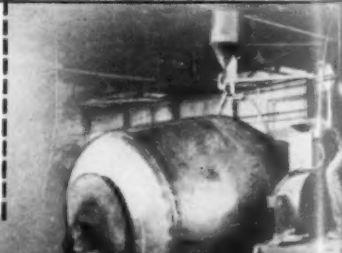
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INDUSTRY NEWS



Mechanical unloading of concrete block reduces time and cost of delivery. Developed by Arthur Rehberger & Son, Inc., the unloading device may be used on any conventional tandem axle truck, with driver controlling unloading operation from cab

N.R.M.C.A. Yearbook

THE NATIONAL READY MIXED CONCRETE ASSOCIATION has announced the publication of its 1952 yearbook, containing a list of association officers, members of the board of directors, listing of active and associate members, and a brief reference to the work of the association since it was organized more than 22 years ago.

The association lists 516 active members and 77 associate members, a record number for both groups. There are active members in 47 states, in Alaska, Hawaii, Puerto Rico and ten foreign countries.

Buys Tile Plant

TEXAS INDUSTRIES, INC., Dallas, Texas, recently purchased the Ferrell Tile Co. of Arlington, Texas. Equipment of the Arlington plant was moved to the Eagle Ford site of Texcrete of Dallas and Fort Worth, a subsidiary of Texas Industries.

Distribution of Tex-Tile will be confined to the Dallas-Fort Worth area for the present, but when expansion plans, now underway, are completed, will be extended to other Texas Industries' subsidiaries in Austin, Corpus Christi and Pharr, Texas, and Shreveport and Natchitoches, La.

The research division of Texcrete of Dallas is now working to develop new features in the Ferrell tile and the addition of new colors to the product.

Roof and Floor Systems

NATIONAL CONCRETE MASONRY ASSOCIATION has announced the availability of a 4-page folder on roof and floor systems. The folder was used as an insert in the Producers' Council Technical Bulletin No. 61, which was devoted to "new product uses." The technical bulletin is distributed to 10,000 leading A.I.A. architects who use it as a reference for various building products.

This is the fifth consecutive bulletin in which N.C.M.A. has been represented. Each insert contained four pages describing the characteristics, advantages and applications of concrete masonry in construction. The response on the part of the architects to the inserts was said to be far beyond expectations and indicative of a profitable promotional effort.

Adds Batching Plant

WILLISTON CONCRETE PRODUCTS CO., Williston, N.D., has expanded operations by the addition of a new batching plant, including two 65-ft. elevators, a 100-cu. yd. aggregate bin and a 750-bbl. cement silo. The plant is equipped with bin signals, vibrators, live steam generator and conventional screw conveyors. The company has also added a new 4-cu. yd. Challenge mixer, mounted on a G.M.C. tandem-axle truck, increasing its fleet to three trucks. In addition to ready-mixed concrete, the company also produces standard concrete and lightweight block. Harry Hieb is general manager and Russel Bartels is production manager.

Cover Picture

THE EXHIBITION BOOTH of Mo-Kan Concrete Products Association at the Kansas City, Mo., home show this spring featured the use of sand, Haydite and cinder block in various combinations. It was estimated that about 95,000 people visited the week-long home building show.

The association's booth had a facsimile of a section of basement wall showing proper construction and a projectograph showing masonry construction views. The booklet, "Facts About Concrete Masonry," was distributed at the booth and those interested could sign up to receive a concrete masonry house plan book. The booth was serviced by employees of member companies.

Other exhibitors at the show included Carter-Waters Corp., Concrete Building Units, Mineral Products Co., Cast-O-Stone, and Perma Stone.

BUILDERS CONCRETE BLOCK CO. has announced the opening of a concrete block plant at Lone Dell, Mo. The new plant is under the management of Charles Scharnhorst.

SOUTHERN ZONOLITE CO. has doubled the capacity of its Jacksonville, Fla., plant with the addition of pre-cast insulating roof slabs to its line of products. The company also produces other insulating materials, plaster and concrete aggregates, fertilizer fillers and acoustical materials, made from vermiculite. R. W. Sterrett, president, stated that the expansion was undertaken because the company's plants in Georgia were unable to meet the demand for roof slabs in Florida.

BOGGS CINDER AND CEMENT PRODUCTS CO., INC., Danville, Va., has changed its name to Boggs Concrete Products Co., Inc. E. U. Boggs is president of the firm.

THE SOUTH DAKOTA CONCRETE MANUFACTURERS ASSOCIATION held its 1952 convention in Aberdeen, S.D., March 20-21. The convention was held concurrently with the J. C. Homebuilders Show at which the concrete firms were invited to display their home building products. Officers of the association are J. B. Dyer, president; Roy T. Collins, vice-president; and Merrill Allen, secretary-treasurer.

CONTRACTOR SUPPLY CO. is a new ready-mixed concrete firm recently established at Pittsburg, Kan. Vernon M. Cagle, Carthage, Mo., is in charge of operations. The firm will supply concrete for the construction of a new sewage disposal plant in Pittsburg.

BARTILE ROOF MANUFACTURING CO., producer of colored lightweight roofing tile, has established a plant at Rapid City, S.D. A franchise from National Bartile Roof Corp. allows the company to distribute its product in 17 South Dakota counties—Butte, Lawrence, Meade, Pennington, Custer, Fall River, Harding, Perkins, Zieback, Haakon, Jones, Lyman, Tripp, Millette, Washabaugh, Bennett and Shannon. The new branch firm will be known as Whitaker and Mattson, of which Harold M. Whitaker is president. Other officers include W. A. Mattson and W. A. McCullen.

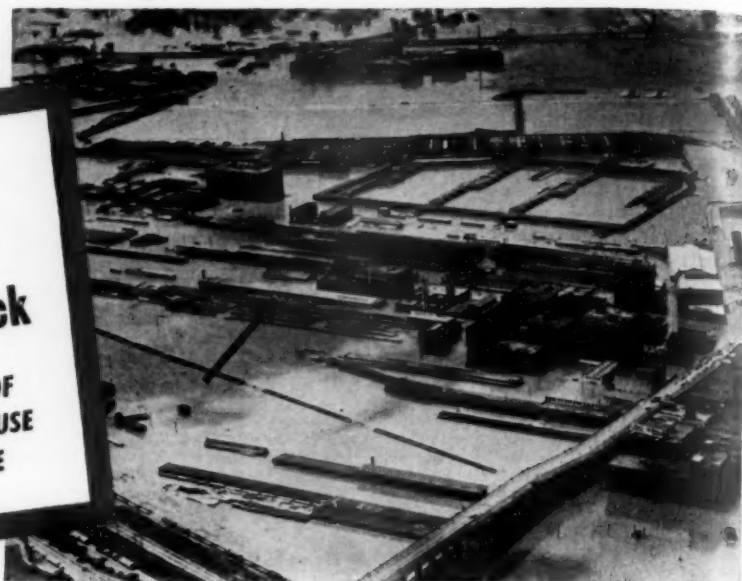
TIPTON CONCRETE BLOCK CO., Tipton, Mo., recently resumed operations under its new owner, Louis A. Bestgen. Besides concrete block, the firm also produces Haydite block.

ADOLPH C. BROMGARD, Billings, Mont., was elected president of the Montana Ready-Mixed Concrete Association at the annual meeting held recently at Helena, Mont. He was formerly vice-president of the association. Other officers elected were Oscar Peterson, vice-president; Eugene Fehlig, secretary-treasurer; and C. B. Nicely, Floyd McElroy, Ed Wilson and Wayne Prouty, directors.

HERE'S WHY THEY ASK FOR 'INCOR'

Greater Kansas City's Valiant Come-Back

SPEEDY REBUILDING OF
SANTA FE FREIGHT HOUSE
A TYPICAL EXAMPLE



Faster Thorough Curing with 'Incor' 24-Hour Cement Assures Utmost in Heavy Duty Floor Service

● An idea of the driving energy behind the great come-back of Greater Kansas City, after last July's catastrophic flood, is conveyed by all-out speed in rebuilding the Santa Fe Freight House (arrow in photo, above) in the Central Industrial District.

As soon as flood waters receded, tons of debris were cleared out, new fill brought in, and the structure rebuilt, with a heavy-duty 'Incor' concrete floor replacing the old wooden floor.

Concreted two bays at a time, 'Incor' concrete was in use the day after placing, saving vital time. The Freight House, with its strong, durable, new floors, 3700 ft. total length, was back in full service ten days after the water receded!

Typical 'Incor' performance—explaining why so many users ask for America's FIRST high early strength portland cement—and why so many Ready-Mix Operators make 'Incor'* concrete available as part of their good service.

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THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM
Freight House, Kansas City, Mo.

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Concrete Floor Contractor: **JOHN ROHRER CONTRACTING COMPANY**
Ready-Mix 'Incor' Concrete: **READY-MIXED CONCRETE COMPANY**
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TV SHOW BOOSTS BLOCK SALES

Los Angeles television program promotes construction of concrete masonry homes

By ROBERT F. WELCH



Figuring prominently in the TV show sponsored by Concrete Masonry Manufacturers Association of Los Angeles are, l. to r. standing, Clif Hendrickson, secretary-manager of C.M.M.A., and Dave Ballou, producer of "A House to Live In." Seated are Hal Smith, moderator, and William Allen, architect

SOUTHERN CALIFORNIA CONCRETE masonry manufacturers have an arduous task selling their product to a skeptical public. Thoroughly conditioned to the use of frame and stucco construction, builders in the area are probably among the least block-conscious of any in the country.

Faced with this difficult situation, the Concrete Masonry Manufacturers Association decided about a year ago that it was time to take action. Secretary-manager Clif Hendrickson arranged for a television program which has accomplished astounding results at comparatively low cost.

The half-hour program, entitled "A House to Live In," is simple in format and presents a straightforward account of just how a concrete block home is constructed. So great is the interest in home building today that the promotion is classified as a public service venture, although the show contains many commercial messages.

The program's appeal is directed exclusively at the layman, says Mr. Hendrickson, since architects will use whatever materials their customers insist upon.

As developed by the Los Angeles group, the program is a complete pictorial record of the erection of a block house from foundation to finishing. Broadcasts are made once a week for 26 consecutive weeks, and one home is constructed during each series. Construction is purposely slowed down so that the entire process may be shown during each six-month period.

Structures are financed by lending institutions and all of the work subcontracted to different building crafts. Specialty contractors are asked to

contribute to the expense of the broadcasts and each is given the privilege of appearing on the programs. Almost all of them report that their business has increased as a result of public appearances. Subcontractors generally find that their profit on each TV house is enough to cover advertising expenses. In other words, the additional business they enjoy comes without an actual cash outlay.

Using a regular 16 mm. home movie camera, Mr. Hendrickson takes job progress shots as construction proceeds. Each week he shoots the necessary film and has it processed immediately by special arrangement with Eastman Kodak Co. for showing on Sunday. Construction must be slowed down because following every broadcast a great many people visit the building site. The crowds are disappointed if they find they cannot actually inspect the work they have just seen on their TV screens.

Mr. Hendrickson has had no previous experience with a camera, yet his

pictures have enjoyed a fine reception. He points out that hiring a professional photographer would not only run into considerable money, but there would also be the danger of not getting exactly the right feature on film. Others interested in the program have also used a camera with good results.

The public sees an informal program, in which Hal Smith serves as moderator, sitting in front of a masonry wall backdrop. He discusses the film with Mr. Hendrickson, one of the architects who designed the homes, and one or two of the subcontractors. No scripts are used—the moderator keeps things going without any hint of formality, resulting in a total effect of utmost sincerity. The benefits of home ownership are discussed, shortages of metal and lumber explained, and advantages of masonry block pointed out. One of the most important of these in California is the product's resistance to termites.

Although concrete block has the stellar role, brand names are not men-



This attractive concrete masonry house was photographed at every stage of construction for showing to television audiences of southern California

tioned, and all masonry manufacturers benefit equally. Mr. Hendrickson reports that block sales have tripled during the year the program has been sponsored—most of the increase going into home construction. Some of the pickup undoubtedly is due to a general trend which has been in existence for a number of years. Manufacturers in Los Angeles county were making approximately 15,000 block per day ten years ago. That figure has now climbed to nearly 500,000 of equivalent size.

"People are being made aware of concrete block," says Jack Allen, vice-president of C.M.M.A. "It used to be that when we would point out its many advantages they would come back with the question 'If block are so good why don't we see more of them?' Today that picture is entirely changed. When inquiries come in now, the selling job is already half done. The program has also helped with the financing agencies, who no longer regard concrete block as a relatively new and untried product."

The show is broadcast from 12:30 to 1:00 p.m. every Sunday, at which time the family is usually gathered together and receptive to a semieducational program. Sunday afternoon is an ideal time to actually see the house described on the program. It is estimated that there is a potential of nearly 10,000,000 viewers within range of Los Angeles—extending from San Diego to Santa Barbara. Letters received from outlying points prove that the program is being watched by people in these localities.

Architect W. A. Allen, together with W. W. Wyman, associate architect, have drawn up plans for the houses constructed to date. Copies of the plans and specifications are being made available to the public for \$125 per set. This is for a 970-sq. ft. two-bedroom house.

Western Masonry Meeting

CONCRETE MASONRY MANUFACTURERS ASSOCIATION held a general meeting April 29, at the Rodger Young Auditorium, Los Angeles, Calif.

Guest speakers included Albyn Mackintosh, consulting engineer, and J. T. Helsley, Construction Laboratories, Inc., who gave reports on testing methods and procedure, shrinkage tests and how dollars are made and saved through a testing program; Ray Cooley, Portland Cement Association, suggested available methods for using free advertising; Carl Lewis, Transit Mixed Concrete Co., reported on the association's TV program and on the C.M.M.A. Fair Building at Pomona, Calif. John G. Wurtz reported on the progress of the association's new publication, "Concrete Masonry Review," the first issue of which is scheduled to appear in July. Cost-free subscriptions will be mailed to customers and prospective customers and members are urged to send subscription lists of their clientele to the association office.



View of Kerr Concrete Pipe Co.'s new laboratory, showing scale, testing machine, vibrator, and some cylinders ready to go into the moist room

PIPE PLANT ADDS QUALITY-CONTROL LABORATORY

A NEW QUALITY-CONTROL laboratory, designed to improve the final product and at the same time reduce production costs, has been installed by Kerr Concrete Pipe Co., East Paterson, N.J. The company has been in business for 21 years, producing a full line of sewer pipe in sizes from 6 to 90 in. and above. Present capacity of the plant is 175 cu. yd. per day—both cast and machine-made pipe. The laboratory is now an integral part of plant operations to aid in production of a high-quality product under all operating conditions.

Daily performance tests are made on all materials going into the batch and on the finished pipe. Aggregate moisture tests, sieve analyses and cylinder tests are taken every day. This enables the plant operator to make adjustments compensating for any slight variations in materials supplied to the plant.

The laboratory includes an 8- x 10-

ft. moist room, with two 12-ft. benches and a large table in the center of the room providing adequate waist-height work areas. All equipment necessary for testing the aggregates, cement and the finished product is provided. Major units include a Yoder 100-ton hydraulic press for cylinder and block tests, a Ro-Tap machine and complete set of Tyler sieves for analyses of fine and coarse aggregates, an American Instrument Co. gravity-convection oven with a temperature range up to 180 deg. C., and apparatus for physical cement tests (Vicat and Gilmore needles, etc.). A 3-cu. ft. Muller mixer is kept in an adjacent room for making up trial batches of new mix designs. The Kerr company caps its test cylinders with 75 percent sulfur and 25 percent Silux, using an American Instrument capping machine.

Cylinder racks line two walls of the moist room. Radiant heating coils are installed in the floor of the moist room to keep temperatures within A.S.T.M. limits at all times. Continuous "fog" is supplied through two spray nozzles set near the ceiling.

The laboratory has two prime functions. First, it will aid in the manufacture of a product consistently conforming to specifications, and thereby eliminate rejects. Secondly, it will enable experimental testing of new mix designs to improve the product and at the same time reduce the cost of manufacture. In the short time the laboratory has been in use, it has enabled Kerr to reduce the cement factor while maintaining or increasing strength by proper proportioning of the aggregates. Over a period of years these cost-saving features will more than pay for the laboratory and its operation.



Another view of the laboratory looking into the moist room, with vibrating machine at left

Precast Concrete Bomb Shelters

Pacific Northwest firm manufactures precast reinforced concrete shelters to withstand 750,000 p.s.i. pressure

ALTHOUGH BACKYARD A-bomb shelters are now being manufactured and offered to the public in various sections of the United States, it remained for Atomic Shelters, Inc., a new Tacoma, Wash., concern, to offer in the Pacific Northwest what it terms the first standard economy model at a price of \$595 plus \$50 installation charges. Most bomb shelters now being manufactured cost from \$2000 up.

This latest economy model was the result of several months' intensive research headed by a Tacoma pathologist, Dr. Charles P. Larsen. He attended a course of instruction conducted in Washington, D.C., by the Army Medical Center on the medical aspects of atomic energy. Numerous scale models were constructed and discarded before perfecting the present model, which is now being manufactured at Graystone Products Co. in Seattle.

The "Unicast" (as it is termed) reinforced concrete shelter is a one-piece casting with heat-cured concrete walls 6 in. thick. Its cylindrical design, 8 ft. long with an inside diameter of 54 in., will resist a pressure of 750,000 p.s.i.

It is sturdily built with reinforcing tubular and mesh steel running in both longitudinal and circular directions and is guaranteed waterproof by its designers.

The shelter weighs 11,000 lb. and is equipped with a round steel, bank vault-type door at one end, beveled inward so that a blast cannot blow it inward. The door opens from both sides so children, at play, using it for

an ideal playhouse, cannot accidentally imprison themselves.

The shelter comes equipped with a filtered air intake capable of removing atomic fission products; a hand-operated air exhaust fan installed on the inside of the door; two benches which comfortably seat ten persons; a latticed wooden floor and a wrench, shovel and first-aid kit. An instrument for testing the outside air for radioactivity is also available.

The shelter is delivered by truck to the backyard of the purchaser as a complete unit, to be installed in the yard to at least half its depth, or it can be completely submerged. In any case, it is covered by at least an 18-in. layer of earth on top, with a mound or trench in front of the door. Should the entrance become blocked with debris, the shelter occupants can remove the door with the wrench and shovel their way out.

Although no actual atomic bomb test has ever been made on the shelter,

its designers say, "Reasonable protection against atomic radiation is achieved."

Production of the shelters at the start is four per week, with an estimated capacity of four or five a day expected, depending on orders.

Prefabricated steel forms are employed for construction of the shelters, with the cylindrical form standing on end and concrete placed in it from the top. The whole form is agitated mechanically for vibration of the mix.

Obviously, the "grim" popularity or demand for these heavy bastions will be largely dependent upon the public's realization and acceptance of the possibility of war. Most residents of the Pacific Northwest are anxiously aware that they are only a few hours flying time from Russia's Siberian-based jet bombers. In event of war, many of the enemy's speedy bombers will inevitably get through our far-flung defenses.

Right: Bomb shelter with door open. The bank vault-type door can be opened from both sides and is beveled inward to resist blast pressure. Below: General view of concrete A-bomb shelter



UNIVERSITY OF MICHIGAN LIBRARIES



Albuquerque Gravel Products Co.'s ready-mixed concrete plant No. 2 is notable for using one of the largest concrete mixers in the world, a 6-cu. yd. tilting-type unit

TWO-WAY RADIO FACILITATES CONCRETE DELIVERIES

Central-mixing plant of Albuquerque
Gravel Products Co. has 6-cu. yd.
concrete mixer

By WALTER B. LENHART

ALBUQUERQUE GRAVEL PRODUCTS CO., Albuquerque, N.M., has two ready-mixed concrete plants. Plant No. 1 is the older and is located in downtown Albuquerque. Plant No. 2 is the newer plant, located in the northeastern section of the city not far from one of the company's gravel plants. This section of the city has begun a tremendous building boom.

Bulk cement is trucked from the older ready-mixed concrete plant to the new unit. Sand and gravel was formerly hauled to the plant by 5-axle truck trailers having a maximum capacity of 75,000 lb. Weight restrictions have led the company to convert these units to cement trailers, and gravel is now hauled in conventional dump trucks by a contractor.

There is a bin of 350 ton capacity divided into eight equal "drive-over" type compartments for receiving aggregates, each of which has three gates. One gate in each compartment is remote controlled, whereas the other two are manually controlled. Reclaiming is done by a 30-in. belt conveyor, delivering to eight steel overhead bins in the batching plant proper. The bearings on idlers are greased for life. A revolving chute is provided at the top of the bins, so hooked up that aggregate cannot get in the wrong bin; all controls are in the ready-mixed concrete plant itself. Hi-Lo bin indicators were in the bins at the start of operations but the top indicators have been removed as the impact of falling rock wore them out. High level indicators have been replaced with a locally made type that

withstands the impact. The belt serving the bins is 24 in. wide.

The batching plant features a fully automatic Noble weigh batcher (7 cu. yd. capacity) serving a 6-cu. yd. T. L. Smith tilting-type central mixer that is powered by a 100-hp. motor. This is one of the two largest mixers in use in the world. A steam boiler is available for use in cold weather and water is supplied from a Jensen deep well pump alongside the plant.

The plant has a capacity of 180 cu. yd. per hour. Pozzoloth (Master Builders) is the dispersing agent used. A cylindrical 500-bbl. capacity cement silo is a part of the batching assembly. The plant is well laid out. A considerable area around the plant is enclosed by a high steel fence.

Two-Way Radio

The Albuquerque Gravel Products Co. has a fleet of 32 ready-mixed concrete trucks, 26 of which are provided with Motorola two-way radio equipment; eight other radio units are in staff cars and pick-up trucks. The company is licensed to use 60 radio-equipped cars. This installation, by which trucks and field men keep constantly in touch with the main office, materially aids production and speeds delivery.

The company has a research and testing laboratory and during the past year has carried on extensive investigations under the direction of W. K. Wagner, a registered civil engineer, concrete technologist. Albuquerque Gravel Products Co. is not wholly satisfied with ordinary production of con-

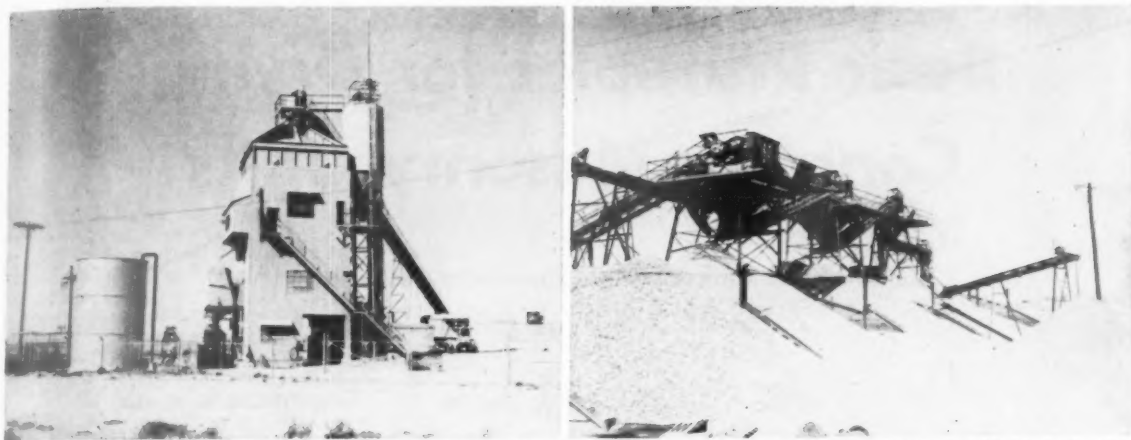
crete, its durability and other general characteristics and has come up with some findings that have proved of considerable value. Some \$40,000 has been spent in this research work.

Gravel Plant

The company a few years ago built a new gravel plant about 5 miles north of the city, and last year the operation was revamped with most of the work involving the installation of a surge pile ahead of the primary crushing and screening operations, and the installation of a 2½-cu. yd. 80-D Northwest shovel powered by a Murphy diesel. The latter replaced the older dragline system.

Trucks haul from the pit alongside the plant to the truck hopper that serves a 30-in. belt that is 400 ft. between centers. The surge pile is at the end of the belt. Under the truck hopper to No. 1 belt is a 30- x 84-in. Jeffrey electric vibrating feeder with a second feeder of the same make in the concrete reclaiming tunnel under the surge pile. This additional equipment has resulted in a more efficient operation and has increased the plant's tonnage materially.

The company has a second gravel operation in the Albuquerque area. The older plant south of town is known as Plant No. 1 and at present is under lease to a local highway contractor for city paving work. The plant referred to above is No. 2, and material from it serves the company's ready-mixed concrete operations as well as the construction industry in the area.



Left: Ready-mixed concrete plant No. 2 features a 7-cu. yd. weigh batcher serving a 6-cu. yd. tilting-type mixer. This is one of the largest mixers in use in the world. Right: Final screens at the company's gravel plant No. 2. The screens are mounted in a single row over a truck reclaiming tunnel, with short inclined belts serving each set of vibrating screens

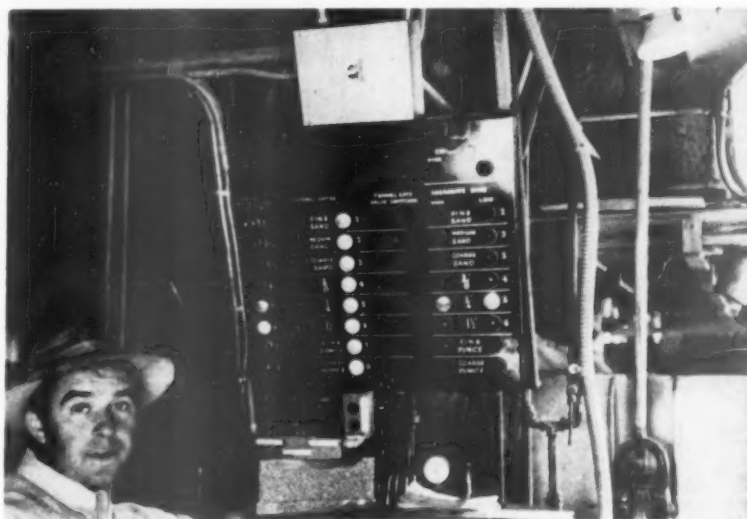
The deposit at Plant No. 2 is well balanced with regard to sand and gravel ratios, and the gravel is not large. A small amount of stripping is done. The working face of the pit is about 30 ft. high. The bottom of the pit is high in sand. The truck haul of 500-600 ft. to the unloading hopper is over easy grades.

In the plant are six Cedarapids vibrating screens, all 4- x 12-ft. units operating dry. In the preliminary treating section is a 10- x 40-in. jaw crusher with a 3-ft. Symons cone as a final reduction unit.

The final screens are all mounted in a single row in a steel framework over a truck reclaiming tunnel, with short inclined belts serving each set of vibrating screens. As wind storms are quite prevalent in the Albuquerque area, the finer sizes of aggregate flow to the top of the storage pile through a ladder-like arrangement that is almost a duplicate of the stone ladders used to minimize breakage in rock plants. Because of the wind conditions in the semi-desert areas surrounding the city, it is not deemed practical to wash aggregates because of dust contaminating the finished material. However, it may later become necessary because of local engineering specifications.

The main conveyor belt from the surge pile is provided with a recording ammeter and from its graph daily tonnages can be estimated. The plant has produced as much as 654 t.p.h. for an 8-hr. period when running 2-in. maximum size aggregate. All material is trucked from the plant.

M. Eugene Sundt is vice-president and general manager of the company. Mr. Sundt is well known to members of the National Sand and Gravel Association and National Ready Mixed Concrete Association, and is one of the directors of the latter. Ward Anderson is secretary-treasurer. Leon Fredrich is plant superintendent and Claude Adams is assistant plant superintendent.



Electric control panel at ready-mixed concrete plant No. 2

Concrete Conference

THE FOURTH ANNUAL MICHIGAN CONCRETE CONFERENCE was held at Michigan State College, East Lansing, April 22-23, 1952. Chief topics of discussion were on new developments in the design and construction of concrete pavements. Subjects included practical methods of concrete pavement design; concrete for residential street construction; modernizing highways; prestressed concrete bridges; architectural concrete; and reports from the research and testing division of the Michigan Highway Department on pavement research programs being conducted throughout the state.

Speakers on the program included M. P. Brokaw, regional highway engineer for the Portland Cement Association, Indianapolis, Ind.; Charles M. Ziegler, Michigan state highway commissioner; Gordon K. Ray, Highway Bureau, P.C.A.; E. A. Finney, research engineer, State Highway

Department; F. F. Loy, district engineer, P. C. A., Des Moines, Iowa; and C. B. Laird, construction division, State Highway Department.

Sponsors of the conference were the Portland Cement Association; Michigan Highway Department; Michigan Municipal League; County Road Association of Michigan; Michigan Road Builders Association and the Department of Civil Engineering, Michigan State College.

Association Elects Officers

THE NEW JERSEY READY-MIXED CONCRETE ASSOCIATION, a newly formed organization, with headquarters at Newark, has elected the following officers: Michael Deskovitch, Valley Concrete Co., Hanover, president; Louis R. Potter, Raritan Mercantile Corp., vice-president; George L. Claffen, Utility Construction Co., New Brunswick, secretary-treasurer; and William J. Gaynor, Orange, executive director.

Basic Principles for Drying Concrete Masonry Units

Methods and economic considerations involved in setting up a block drying installation

By WILLIAM J. SHORE*

DEMAND ON THE PART of various groups of building authorities for concrete block with 40 percent or less moisture content makes it necessary for block producers to provide facilities for drying concrete block.

Under normal conditions of steam curing, block are continuously in direct contact with 100 percent humidity in the surrounding atmosphere, due of course to the need of completing the hydration cycle without loss of moisture content.

Because of this fundamental necessity, block when withdrawn from kilns are generally loaded with moisture. When removed from racks and cubed, and left to stand in the yard, they lose this moisture and gradually settle to a condition that represents a state of equilibrium with surrounding atmospheric humidity. The length of time required to reach this state depends upon the manner in which block are cubed or stacked. It varies widely, and it is impossible to make calculations with nominal and reasonable accuracy of the degree moisture in block.

To meet the increasingly difficult and severe requirements for block moisture content with any degree of certainty therefore requires the installation of equipment to make it possible to deliver dry block with moisture content in accordance with these new demands.

A general survey of the method and means employed up to now to dry concrete block indicates a lack of knowledge of the elemental principles that govern such an operation—an operation that is fundamentally a matter of heat transmission and heat transfer.

Concrete block should not be subjected to any drying operation until it is definitely known that cement hydration is reasonably complete. We know that the hydration process acts rapidly at the start of steam curing, gradually slows down, and is not entirely completed for at least 45 days for high temperature steam curing systems. However, if at any time there is sufficient strength in the block, the drying process may be initiated without danger of affecting block strength adversely.

Moisture Distribution in Block

From an examination of broken pieces of block that had been lying about the yards in block plants, it appears that moisture in block penetrates only a short distance from the outside surface. In sand-stone block there is found a distinct demarkation varying about $\frac{1}{4}$ in., more or less, from the outside, showing a distinctly different coloration from the inside of the block. This is on block that had been lying around for a matter of a year or so.

From this it appears that moisture penetration is not deep. This is definitely an advantage in drying, since it does not become necessary to have drying heat penetrate to the inside of the block areas, which of course would demand a longer period of time.

Drying Concrete Block

For block not placed in autoclaves, the most workable method for driving off water content is to heat the block up to temperatures in excess of 212 deg. F. The amount of temperature in excess of this depends upon the speed desired for the drying process.

When the block reaches a temperature in excess of 212 deg. F., all free water is converted into steam and leaves the block. The rate at which it leaves the block is determined by the pressure at which it is confined. At 212 deg. F. its pressure is equivalent to the surrounding atmospheric pressure and there is no inducement to cause it to leave the block. When, the temperature of the steam is increased, its pressure is likewise increased along with its urge to distribute itself in the atmosphere and it makes haste to leave the many fine interstices of the block structure. At 330 deg. F. its pressure is around 100 p.s.i., and it is easy to realize that such steam cannot be confined to the block structure and mass.

Thus, by bringing the concrete block to temperatures in excess of 212 deg. F., we convert water into steam. By increased temperatures in excess of this amount, we increase steam pressure and intensify the activity of the

steam generated, causing it to leave the block more rapidly, and thus in essence shorten the drying cycle. The entire drying cycle is as simple as that.

It must not be inferred that block cannot be dried at lower temperatures. They can be dried at lower heat, but it requires a longer time to complete the entire drying cycle.

Block Characteristics

With regard to special characteristics of block that affect the general design and operation of drying systems, there are two, one advantageous, the other burdensome.

Since concrete block are composed of rugged materials, they are not subject to damage or harm by high temperatures, that is, temperatures less than 1000 deg. F. It is thus possible to make use of extremely hot combustion products to raise block temperatures. This is an advantage.

Block are made in huge quantities continuously. A production of 2000 block units per hour involves an hourly weight of from 30 to 40 tons of material per hour which must be elevated in temperature from 150 to 250 deg. F. each hour and demands substantial quantities of fuel for this purpose.

Drying System

Placing block to be dried in a properly designed dry room, products of combustion are introduced into this room and recirculated in and about the block to raise them to the proper degree of heat required. In addition to this, a continuous quantity of fresh air from the outside has to be introduced, and simultaneously there must be an expulsion of an equal quantity of hot moisture laden air. This is not the only way in which block may be dried, but it is a system that is lowest in installation cost, lowest in operating charges, and most easily applied to the mechanics of block production.

It is possible to produce a source of heat by passing air through steam coil heating units. This requires steam boiler capacity, and where only low pressure steam is used, does not permit a discharged air temperature of much more than 180 deg. F. and thus demands a longer heating cycle. It re-

*Shore Engineering, New York, N.Y.

quires 25 percent excess fuel for the same results because of loss in converting fuel to steam. It taxes demand on the steam boiler plant which often is insufficient in capacity.

Fig. 1 shows diagrammatically the entire operation of a drying system using direct products of combustion from oil or gas fires. (It is not a reproduction of any installation, but merely indicates the entire drying mechanism in operation.)

In the center is a load of concrete block. This is surrounded by an enclosure, the dry room. At the right is an opening. Into this a mixture of fresh air is forced through a supply fan, and also the products of combustion from the burning of oil or gas, either natural or manufactured. This is the source of all heat. At the top in the center is a dividing diaphragm extending from one side to another. In this is mounted the recirculating fan. As will be noted, this fan picks up the mixture of fresh air and products of combustion and discharges them to the other side. This produces a continuous whirl or recirculation of hot air. At the left side is an exhaust fan that continuously takes out a quantity of air, sufficient to make up for the air that is being introduced at the right hand side.

Operation

Products of combustion are introduced with quantities of fresh air to provide a source of heated gas, which when coming in contact with block surfaces will give up heat to the block.

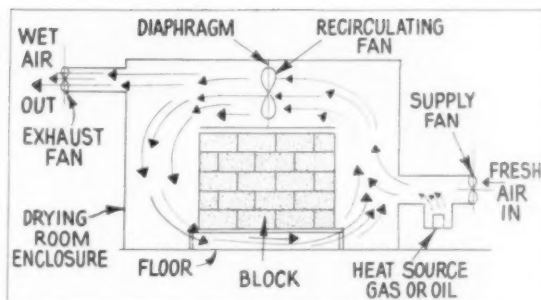
The recirculating fan serves several purposes. Its main function is to force the air into turbulence and to throw it against and to push it into intimate contact with the block. It makes it possible to obtain greatest utility from this heated air by recirculation. The only heat transfer that can be obtained from hot air to block is that part of the air in actual contact with the block. Actually, that is only a small part of the air that is introduced into the heating chamber. Without recirculation this unused part of the hot air would be discharged without having transferred its heat, and equally important, without having taken up from the block the moisture that was coming to the surface.

The effect of recirculation is not only to make best and most efficient use of the heat units in the hot air supplied, but also to make it most effective in picking up moisture from the block.

The exhaust fan throws out of the dry room the hot air that has absorbed the water from the block. Thus, there is a continuous cycle of removing water from the block until no more water is left in the block. Without discharging the wet air, no drying effect takes place. It merely becomes something like a curing kiln with wetness all over the walls. The exhaust fan eliminates this moisture and removes it from the room entirely.

This is a simple system and when

Fig. 1: Diagrammatic sketch of block drying system



properly designed, of ample capacity in all its component parts, proves highly efficient and effective.

Cycling Drying Operations

If we assume a total of 2000 standard 8-in. units to be dried per day, made on an 8-hr. shift, there are some producers that would load this entire quantity of block into one room. They would start up the operation at 5 p.m. and would shut it off at 7 a.m. the following day to remove dry block and load up the next day's production. This gives a drying time of 14 hr.

Actually, this is not the best way to carry out this operation. It would be better to have a dry room large enough to take 1000 block. This would be loaded at 12 noon. Block would then be left there till 8 p.m., these removed, and the balance of the load put in to remain until 7 a.m. the next morning. Thus a room half the size would be ample and could be operated more efficiently.

Fuel Required and Costs

In a properly designed and operated drying system, the following approximate amounts of fuel are required for drying out 1000 standard 8-in. units.

	Sand-stone block	Cinder or lightweight aggregate block
Fuel oil No. 2, gal.	28	20
Natural gas, cu. ft.	3500	2720
Manufactured gas, cu. ft.	7000	5440

For a 24-hr. drying capacity of 4000 lightweight aggregate standard 8-in. concrete block, the cost of drying enclosure, drying equipment and installation would be approximately \$6000 to \$7000, depending more or less upon local conditions.

Conclusion

A block drying system might be of real advantage if installed on a small scale to take care of special requirements on block for certain semi-private and public institutions where specifications are extremely rigid for percent moisture in block.

It is most doubtful whether this expense would warrant drying installations for all block plants for their total production. All block held in storage gradually assume a moisture content high or low, depending upon the average humidity conditions that prevail. There would be no advantage in removing moisture from block only

to have these same block automatically reabsorb new moisture immediately after they were put in storage.

Naturally a block drying system that would bring block moisture down to local humidity conditions would cost less to install and operate than one that removes all moisture content. There might be an advantage in having a partial drying system to make certain that all block, no matter what section of the cube they were in, would be dry enough to pass nominal requirements for moisture content.

There is no doubt though that block drying systems in one form or another will in due time become a definite part of the entire block manufacturing process. It will only accentuate a steady trend in this industry toward achievement of a high and uniform quality product.

"Antiseptic" Concrete

ADDITION OF COPPER or copper compounds to portland cement may be the answer to the problem of finding an economical antiseptic concrete, reported Radcliff F. Robinson and Chester R. Austin, Battelle Memorial Institute, Columbus, Ohio, in *Industrial and Engineering Chemistry*, September, 1951.

A copper-portland cement concrete could be used as a flooring material in locker rooms or showers, around swimming pools, in industrial kitchens, or wherever a sanitary environment is important. The authors reported that the cost of such a concrete would be low and could be further reduced by using only a topping layer of the mixture. The color of the additive would eliminate the necessity of frequent painting.

The effect of the copper compound additions on physical properties of concrete would probably limit its use to a thin surface or finishing layer applied over a base of ordinary concrete. Tests on block with a $\frac{3}{8}$ -in. topping of copper-bearing concrete showed that such specimens had approximately the same inhibitory effect as solid specimens.

Building Block Plant

RINKER MATERIALS Co., West Palm Beach, Fla., is building a \$250,000 concrete block manufacturing plant at Fort Pierce, Fla. Plant capacity will be 4500-6000 block per day.



Left: Concrete oil tanks before top caps are placed. Note the segment of the outer form at right. Right: Workman pries loose the outer shell from a newly cast Consphere

Precast Concrete Oil Tanks

Tacoma Builders Supply Co., Tacoma, Wash., capitalizes on steel shortage by supplying precast concrete oil tanks for home builders

WITH STEEL SHORTAGES becoming more critical under the impetus of the rearmament program, home builders are finding it increasingly difficult and costly to buy steel underground oil storage tanks for home heating installations. Tacoma Builders Supply Co., Tacoma, Wash., believes that it has the solution to the problem in the form of an all-concrete underground oil storage tank, which its inventor calls a "Consphere."

The new development is the invention of A. R. Anderson, a consulting engineer of Springdale, Conn., whose brother owns and operates Tacoma Builders Supply Co. which is now manufacturing the tank in its Tacoma plant.

The company claims that the Consphere tank is designed to last permanently and, being molded of high strength concrete, cannot rust or corrode as does a steel tank. It is claimed

By A. R. MacPHERSON

that since concrete is an inert material, the tank will not react with fuel oil or water and is almost guaranteed not to leak or require expensive replacements and repair costs as does the steel tank commonly used.

The spherical tank is a one-piece monolithic structure having no seams other than the cover at the top of the tank. This one-piece construction was developed for maximum strength against external earth pressure. As proof of the soundness of the principle, the company points to the circular masonry arches of the ancient Romans that have remained intact for nearly 2000 years.

The suitability of concrete for oil storage tanks has been proved by many large capacity concrete tanks

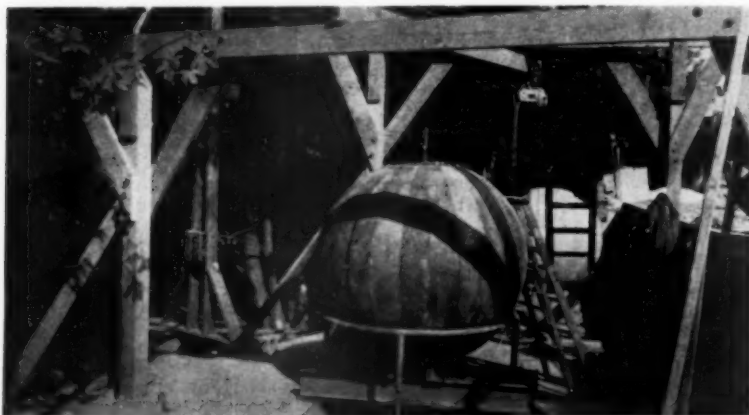
built in recent years by oil companies and by the Navy, but its application for home heating installations has not yet come into general use and acceptance.

At present, the company is building only tanks of 600 gal. capacity and sells them for \$90, not including cost of installation, which price is about 30 percent less than the average cost of a steel tank of the same capacity. The concrete tank weighs approximately 2000 lb. and is 5½ ft. high, with 2 in. thick walls. No reinforcing is used except small wire mesh in the top.

Tank Construction

Construction of the Consphere tanks calls for some unusual methods employing two separately assembled steel spherical shells to serve as a mold for forming the tanks. The problem of how to get one spherical steel shell inside another one, fill the intervening space with concrete and later remove the inner steel sphere, presented problems that would tax the wits of the best magician. The solution to this particular problem constitutes the feature upon which Mr. Anderson is securing a patent on his invention.

The inner steel sphere is made up of 13 staves or leaves similar in shape to those in a wooden barrel. The steel staves are assembled on the inside perimeter of a circular tube frame, the bottom of the staves being secured to a round steel plate. Three steel wires spaced through eye-holes around the inner perimeter of the sphere pull the staves tightly and securely together by attaching them to a steel shaft running down the center of the sphere. Turning the



Inner steel form for tank assembled on casting platform

shaft tightens the wires and draws the staves into a compact spherical form. A circular opening large enough for a man to crawl through is left in the top of the sphere.

Once the inner sphere is assembled the tubular frame is removed. The outer steel sphere consists of four quarter segments or sections which are bolted into place around the inner sphere, the sections being bolted tightly together on raised seams with, however, a large opening left in the top section through which to place concrete into the interspace between the inner and outer shells.

A 1:2:3 batch of concrete using fine aggregates is then mixed in a $\frac{1}{2}$ -cu. yd. mixer and channeled into the top opening of the Consphere form which, when completely assembled, rests on a base of two steel rails. A motorized vibrator operating under the base serves to vibrate the concrete by shaking the whole Consphere form, thus removing all air bubbles and settling the concrete into the solid mass necessary to form a leak-proof concrete tank.

After the concrete has set for 30 hr. or longer, a workman crawls inside the inner steel sphere and pries loose the steel staves, passing them out through the top opening. He unbolts the outer steel shell and pries loose the four quarter segments forming the shell. Wet canvas is then wrapped around the Consphere to insure slow and thorough curing.

In the final operation, a concrete cap is cemented into the top hole of the Consphere to make it leakproof. Four threaded iron collars for pipe entrance into the tank are also cemented into the cap. The Consphere is now ready for home installation.

The Consphere is finding increasing acceptance for home heating installations despite the fact that such a revolutionary invention does meet with some reluctant and suspicious acceptance because of its radical differences from the conventional type of tanks. The Conspheres are also being manufactured now on the East Coast and with the growing steel shortages they are expected to find an increasingly larger market.

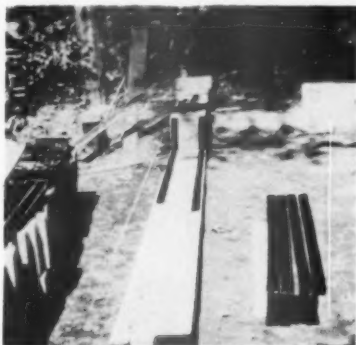
Eschenbrenner Awards

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, sponsor of the Eschenbrenner awards, has named Carl C. Walker, president and chief engineer, Jennings-Lawrence Co., consulting engineers, Columbus, as chairman of the board of judges for the 1952 competition.

The Eschenbrenner awards, open to all senior civil engineering students east of the Mississippi river, have attracted entries from several states. Papers submitted in the contest deal in non-monolithic concrete products, with \$500 awards going to district winners.

Prefabricated Masonry Joints

PRECISION-MADE CONCRETE block on prefabricated masonry joints is a new method of construction designed to cut labor and material costs, combined with the advantages of a fire-



Two prefabricated masonry joints laid on wall against block, ready for placement of another block

proof structure as pioneered by R. W. Stencel, R. W. Stencel System, Lachine, Montreal, Canada.

The prefabricated joint is made of building paper, coated on both sides with a strong adhesive that holds the block together, with no pointing up or other work being necessary. The resulting walls are thus finished with straight and clean-cut joints which are claimed to be waterproof and airtight and entirely covering the webs of the horizontal and vertical concrete block.

When walls are laid in this manner, the cores of the block are not blocked with mortar and can be used for ventilation of gas and odors from kitchens, bathrooms, garages, etc. Air space is available for electric wiring

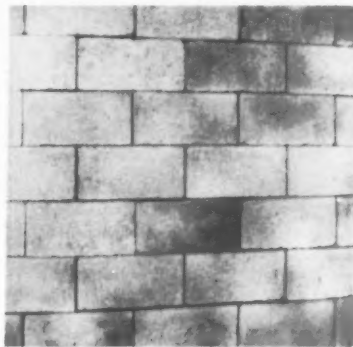


Two joints placed against wooden joist, ready for placement of block

and pipe. Certain of the cores in the block can be used as hot-air ducts, which would reduce the cost of the heating installation.

To reduce costs further, Mr. Stencel suggests that the baseboard on

the inside of each room be made of concrete block which could be laid during the course of construction. Moulding around doors and windows would not be necessary with the smooth surface of precision block. Door-stops and hinges are cast into the block during manufacture. The ceiling and roof are poured in one operation. The insulation is mixed in with the concrete and the roof is



Finished wall laid with precision block on prefabricated masonry joints

pitched. Mr. Stencel has purchased a concrete block machine which he is converting to make "precision" block. He estimates that if his building method is adopted, up to 50 percent in construction time can be saved.

Concrete Pipe Plant

FERGUSON PIPE CO., Farwell, Texas, has completed plant expansion and recently resumed operations for the production of concrete pipe. The plant was formerly owned by Plains Concrete Co., but was sold to R. A. Ferguson who has expanded facilities to make it one of the largest plants of its kind in that area. Output at the plant is approximately 1200 ft. of pipe per 8-hr. day. Most of the pipe produced are of 12 and 14 in. dia., used primarily for irrigation purposes. Some 16-, 24-, and 30-in. pipe are also produced for use in laying culverts as well as for sewer installations.

H. L. Ferguson is plant superintendent, and S. D. Sugart is field foreman.

ALLIANCE READY MIX CO. recently began operations at its new plant in Alliance, Neb. The company is a subsidiary of Western Nebraska Hollostone Co., Hemingford, Neb., but will be operated as an independent unit. Plans call for the addition of a concrete block plant at the Alliance location. Officers of the new corporation are James W. Melville, president; Clarence Rogers, vice-president; and Willard C. Melville, secretary. Benny Hyland is plant manager.

CECIL LAMBERTSON, Austin, Minn., recently purchased property for the construction of a concrete block manufacturing plant.

NEW MACHINERY

Extends Truck Mixer Line

CHAIN BELT Co., 1600 W. Bruce St., Milwaukee, Wis., has announced two



Truck mixer of 5½-cu. yd. capacity new sizes of truck mixers, the 5½- and 7-cu. yd. Rex Hi-Discharge Moto-Mixers. It is said that the mounting of these two mixers makes possible the greatest legal payload on any truck.

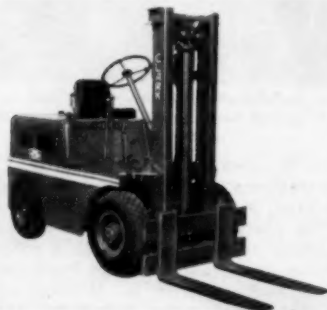
Electronic Listener

GENERAL ELECTRIC Co., Electronics Park, Syracuse, N.Y., has announced the development of an electronic "ear," deaf to all but a single electronic tone, or combination of tones. Connected to a special switch, the device is said to be capable of turning on and off any kind of electrical apparatus, from radio receivers and transmitters to

electric motors. The tone generator is operated from a pushbutton console, and any number of ears can be reached from a single console. The 80 tones used are between 300 and 3000 cycles.

Diesel-Powered Lift Truck

CLARK EQUIPMENT Co., Industrial Truck Div., Battle Creek, Mich., has announced that new diesel power for its Yardlift-40 fork lift truck is avail-



Fork truck with diesel engine

able. The engine, a Model DIX-4D by Hercules, has a bore of 3½ in. and a stroke of 4 in., with 166-in. displacement, giving a brake hp. of 44 at 1950 r.p.m. Maximum torque developed is 118 ft.-lb.

Combination Heavy-Duty Tractor and Fork Truck

TRACTO-LIFT Co., 2011 Baltimore, Kansas City 8, Mo., has announced the production of a heavy-duty machine, combining tractor and fork truck, and known as the Tracto-Lift. The machine is available in four sizes with lifting capacities of 3000, 4000,

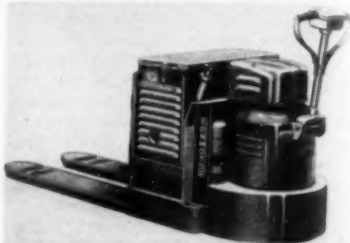
5000 and 6000 lb., with larger sizes to be made in the near future. Fork lengths vary from 30 to 60 in., with lifting heights to 12 ft. 6 in. on current models. A complete line of attachments is available.



Heavy-duty industrial tractor with fork lift attachment

Pallet Truck Generator

TOWMOTOR CORP., 1226 E. 152nd St., Cleveland 10, Ohio, has developed a built-in generator for use with its



Electric pallet truck with built-in generator

electric pallet trucks, eliminating the need for conventional electric storage batteries and recharging. The new unit, Towmotor Model W, is an adaptation of the company's standard electric pallet truck, with a small, gasoline-powered generator supplying constant, maximum voltage for operation of the truck. Electric power is provided to move up to 4000-lb. loads 24 hr. a day.

Silicone Water Repellent

RANETITE MANUFACTURING Co. INC., 1917 S. Broadway, St. Louis 4, Mo., has developed Ranetite No. 11, a silicone-base water repellent for application to exterior, above grade masonry. Some advantages claimed for this product are: easy application by spray or brush; ready application in temperatures as low as freezing; clear and invisible, causing no change in masonry appearance; non-sealing of masonry pores; and deep penetration to insure durability.

Intercommunications System

TALK-A-PHONE Co., 1512 S. Pulaski Road, Chicago, Ill., has introduced an intercommunications system which combines many features of its master-selective and deluxe models, and is adaptable in industrial installations, offices, stores, factories and institutions. This CL series is designed for systems requiring operation of more than one master station along with substations. Master stations are equipped with talk-listen switches, stand-by, station selectors and volume control, while staff stations require no manual operation.

Sealer Paint

THE OHIO AKONA Co., Lakewood, Ohio, has developed a two-coat inside application of Akona cement and stucco sealer paint which is said to provide tested water resistance for outside or inside wall surfaces of concrete block, cinder block, Haydite block, cast-in-situ concrete, etc. Packaged in 10-, 25- and 50-lb. bags, the price varies depending on color and size.

Concrete Sealer

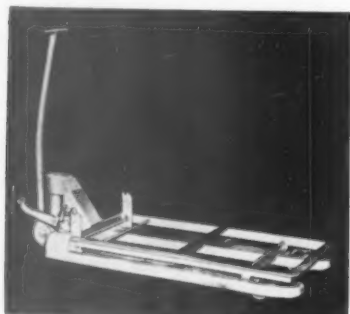
REX HOME SUPPLY Co., 142 S. Highland Ave., Ossining, N.Y., has developed a glazing sealer for concrete. Known as Concrete Glaze, this fast drying clear varnish is company recommended for concrete floors and other concrete surfaces, and is said to seal the pores with a tough and lasting resinous coating that presents a clean, germ-resistant surface. This liquid may be used on both interior and exterior surfaces, and may be applied either by brush or by spray.

Masonry Paint

GOODYEAR TIRE & RUBBER Co., Chemical Div., Akron, Ohio, has developed paints, in cooperation with independent paint manufacturers, which are made with a synthetic, Pliolite S-5. These are said to be satisfactory in resisting attack by alkali present in new stucco, concrete block, monolithic concrete and similar masonry construction materials. Produced in pastels and deep tones as well as white, these paints are expected to be available to most consumers this spring.

Skid Adapter

THE RAYMOND CORP., 21385 Madison St., Greene, N.Y., has introduced a skid adapter that enables conven-



Truck for handling pallets or skid platforms

tional hand pallet trucks to lift and handle skid platforms. By furnishing a hinged superstructure that can be raised out of the way when handling pallets or lowered into position when handling skid platforms, the company has produced a single truck to be used for handling both types of equipment.

Silicone Repellent

WURDACK CHEMICAL Co., St. Louis, Mo., has developed a clear, transparent silicone water repellent, known as Crystal. This repellent is said to be practically unchanged by extreme heat or cold and may be sprayed on at any temperature. Other features claimed for this substance are that it protects mortar joints, as well as seepage through concrete block, etc., and that after application it is invisible and the wall continues to breathe.



Compact truck mixer unit

Truck Mixer

THE TRANSMISSION & GEAR Co., Dearborn, Mich., has announced its compact truck mixer unit, which is available in two models; one contains a Ford industrial engine, while the other incorporates the truck drive principle using a power take-off. The latter eliminates the cost of the engine and is 13 in. shorter than the engine-equipped unit. Consisting of a 3- or 4-cu. yd. capacity mixing drum, planetary type reversing transmission, and a large water tank, either model of the Transo Load Champion is said to reduce operating costs per load while insuring maximum power. A wide choice of lighter weight truck chassis is possible.

than the model it replaces and is considerably smaller in size. The motors are available in open drip-proof and totally enclosed fan-cooled models in Types K (polyphase), KC (capacitor start), KH (split phase), and KCP (permanent split capacitor). Among the features of these motors are new bearings, lubrication system, insulation, ventilation, mountings, windings, and shields, terminal board and leads.

External Vibrator

VIBRO-PLUS PRODUCTS, INC., 54-11 Queens Blvd., Woodside, Long Island, N.Y., has announced its Vibro-Plus vibrating shake-out, a portable device

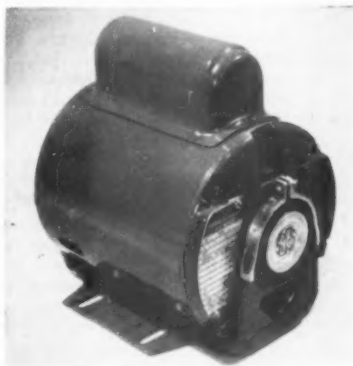


External vibrator with clamping device

which is said to provide an effective and inexpensive method of unloading railroad hopper cars. This unit is a standard type ER Topdog external vibrator with a clamping device. The enclosed, self-contained vibrator unit delivers 3600 impulses per min., is supplied with the shake-out, and is available for operation on 60-cycle, three-phase current in a choice of voltages ranging from 110 to 550 volts.

Fractional Horsepower Motors

GENERAL ELECTRIC Co., Schenectady 5, N.Y., has announced a new line of fractional horsepower motors, designated as Form G. According to the company, this motor weighs as much as 51 percent less per horsepower



Small fractional horsepower motor

Meeting Absorption Tests for Concrete Masonry

A TECHNICAL REPORT by the National Concrete Masonry Association discusses in length the subject of accelerated drying of concrete masonry units. Requirements of the A.S.T.M. and federal specifications limit moisture content of concrete masonry units at time of delivery to a maximum of 40 percent of total absorption. The Corps of Engineers, U.S. Army, specifies a maximum moisture content limit of 30 percent of absorption, with a 35 percent allowance under certain conditions, but only with the approval of the contracting officer. Following are suggestions offered by N.C.M.A., in its technical report, for aiding producers in meeting required specifications.

When furnishing concrete block or brick on jobs where the moisture content limit is invoked and strictly enforced, most producers are confronted with the problem of selecting and installing a method of drying block at some stage after completion of the curing period. If normal air drying in stockpiles proves too slow and ineffectual because of climatic or other conditions, it then becomes necessary to accelerate the drying process with warm air or other means.

A few plants are equipped for drying block in kilns, either immediately following a protracted and adequate steam curing cycle or after a more typical curing cycle plus a period of normal air drying in stockpiles. N.C.M.A. advises that, if properly designed and operated, this method can be integrated with the other production operations and have considerable merit for insuring a fair degree of control over the moisture content. However, this method is not adaptable to all plants.

Another method suggested by N.C.M.A., while not new or unique, has been rarely used. It consists of placing canvas tarpaulins over the stockpiles to be dried and directing dry warm air from a portable heater through an inlet in the canvas at one end of the pile and venting the opposite end to allow the warm air-vapor to escape. Some vapor will, however, slowly filter through the canvas, but this can be supplemented with a vent of from 3-6 sq. ft. in area.

Drying of the units will proceed more rapidly and economically if there is good diffusion and flow of warm air throughout all parts of the stockpile. Insofar as practicable, the cells of the units should provide passageways or ducts for air flow. N.C.M.A. suggests spacing the tiers of cubes 6-12 in. apart. Vertical cell cubing of 8-in. units is being used in many plants in their normal cubing operations, necessitating no extra handling. Horizontal cell cubing is less common and may incur a slight increase in cubing time and cost. The 4-in. units, because the cells are smaller, may create an obstruction to the passage of air, necessitating an added handling operation.

The placing of wood strips between the courses of units will facilitate the air flow. This would require extra handling, but would result in more rapid drying and lower fuel costs. A heater, mounted on wheels, can be placed in the storage yard and shifted about as needed. Any well designed portable heater of suitable heating and ventilating capacity can be used.

The rate of drying and the time required to remove a specific amount of water from block, or produce a certain degree of dryness, are dependent on many variables, but N.C.M.A. has worked out rough estimates of required drying time for stockpiles of various sizes and heaters of different capacities; these have been compiled in table form. It was also pointed out that a producer should consider the fact that, as drying proceeds, there is a decrease in the drying rate and an increase in the heat required to remove each ounce of water from the block, and that if the block have been exposed to normal air drying for some time, their initial moisture content may be such as to require the evaporation of less than the assumed quantities to produce a final moisture content of 30 percent of absorption. Estimates on the cost of accelerated drying, as worked out by N.C.M.A., set the average cost of accelerated drying at about 1.2 cents per 8- x 8- x 16-in. unit and 1.0 cent per 4- x 8- x 16-in. unit. However, actual cost will vary somewhat from the estimates, depending on the initial moisture content, weather conditions, etc. The time and cost of accelerated drying will naturally be reduced if some moisture has first been removed by natural air drying.

Fiberglas Cavity Wall Insulation

A POURING-TYPE Fiberglas cavity wall insulation has been developed by Owens-Corning Fiberglas Corp., Toledo, Ohio, for masonry-type wall cavities. This new type insulation is said to have good thermal resistance, a low enough density to support its own weight without settling, and to have moisture resistance. Made of inorganic nodules of fibrous glass, it also resists rot, termites and fire, according to the company. This insulation was chosen by the Structural Clay Products Research Foundation as the most suitable insulation for this type of cavity wall construction.

The new SCR (Structural Clay Research) insulated cavity wall consists of two wythes of brick, or one of brick and one of tile. Between these is an air space of not less than 2 in. The insulation is poured from bags into the wall cavity after proper construction steps have been taken. In construction of the wall, non-rusting metal ties are used to tie together the two wythes, the inner wythe being built upward, ahead of the exterior wythe

by at least 16 in. The inner wythe, after its cavity side is smoothed, is given a brush coat of vapor-resistant water emulsion asphalt paint, which serves as a vapor barrier.

Tests, made after a cavity wall section was filled with insulation, showed that thermal transmission of the



Newly developed cavity wall insulation gives good thermal resistance, low enough density to support its own weight without settling, and is moisture resistant

insulated wall was less than half that of the same wall with furring and lathing. Temperature of the inside plastered surface on the insulated section was 8 deg. higher than the one with no insulation.

Prestressed Concrete Design Service

THE PRELOAD Co., INC., New York, N.Y., has announced that through a complete revision of operating policy, it now functions as an independent firm of consulting engineers, devoted exclusively to the design of prestressed concrete structures. Prestressing, which has been curtailed for years by patents and proprietary systems, is now being made available to all architects, engineers and contractors for the first time, and the purpose of the policy change is to place prestressed concrete on equal terms with reinforced concrete and structural steel as one of three basic construction materials.

The Preload Co. previously had designed prestressed structures under license of its numerous patents, exclusively for its domestic construction subsidiaries and its foreign licensees. Patent-holding companies, by tying designs to patented systems, have forced the withholding of the advantages and economies of prestressed construction on a normal competitive basis.

As an immediate consequence of the policy change, the company has received a contract from the Corps of Engineers to design a prestressed concrete bridge over the Garrison dam spillway at Riverdale, N.D.

The Preload Co., since its inception in 1934, has designed ten bridges having a combined length of more than five miles, approximately 700 tanks with capacities ranging from 100,000 to 11,000,000 gal., and more than 100 miles of pipe operating under pressures up to 300 p.s.i.

Structures designed by Preload engineers include the Pinellas-Manatee crossing over Tampa Bay in Florida which, when completed, will be 17,500 ft. in length, the longest prestressed concrete bridge in the world; the Walnut Lane bridge over Lincoln Drive in Philadelphia, Penn., which was completed in 1949 and is a 300-ft. structure with a main span of 160 ft. and approach spans of 74 ft.; the world's longest prestressed pipe line without steel cylinders, 36 in. in diameter with a test pressure of 290 p.s.i., carrying the Regina, Sask., water supply 35½ miles from Buffalo Pound Lake to the city; the world's largest capacity prestressed concrete pipe—the waterworks intake in the St. Lawrence river for the city of Montreal, consisting of four parallel lines, 84 in. in diameter; and the largest prestressed concrete tanks in the world—four storage tanks for the Chester, Penn., Water Authority, with a total capacity of 39,000,000 gal. Each of these tanks is 205 ft. in diameter and has a prestressed concrete dome roof 4½ in. thick.

Concrete Vibration Tests

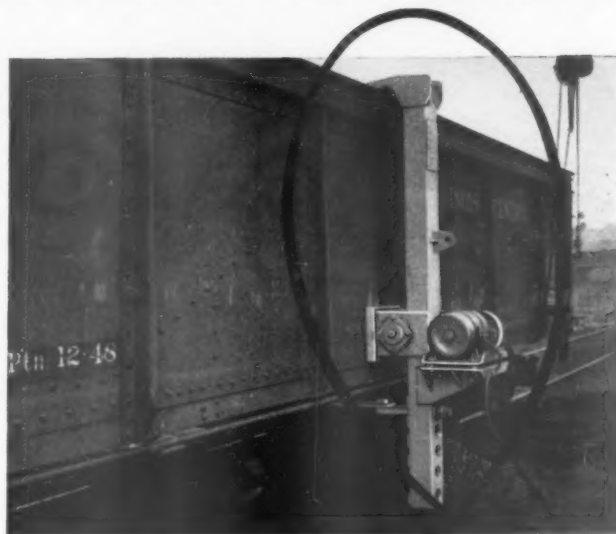
THE CONCLUSIONS of recent tests on the effects of variation of concrete vibration time, as reported in *Highway Research Abstracts*, are: (1) prolongation of vibration time does not affect the quality of concrete generally used; and (2) there is an economic limit of duration of vibration which satisfactorily fulfills technical requirements. If the water-cement ratio is reduced by 1 percent, vibration time must be three times as long, and this gives a 4 percent increase in strength.

Opens Plant

COFFRIN-YORK Co., producer of Bartile concrete shingles, recently opened a new plant at Sidney, Mont. B. E. Coffrin, president, states that the company will distribute its product in eight Montana counties (Daniels, Dawson, McCone, Richland, Roosevelt, Sheridan, Valley and Wibaux) and in three North Dakota counties (Divide, McKenzie and Williams).

BURIAL VAULT MANUFACTURERS of northeastern Ohio, northern West Virginia and western Pennsylvania held their annual spring meeting, May 5, at Youngstown, Ohio. The meeting included a visit to Fithian Cement Products Co., Youngstown. Paul Hupp, Blockstone-Hupp-Wilbert Vault Co., Zanesville, Ohio, was elected chairman of District Four and Robert J. Fithian, Youngstown, was elected secretary.

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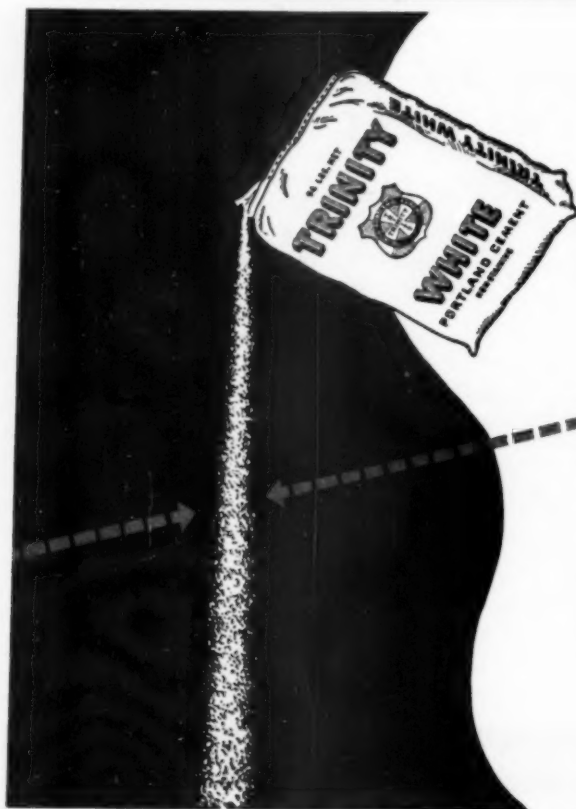
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COMMENT

from the BUTLER ENGINEER

Of Building Booms and Brassieres with Bullets

Well, I'm back to a diet of gruel, brewer's yeast and gallons of milk after the carousel at the Ready Mixed Convention in Chicago and the Concrete Products jamboree in New York. Too much terrapin and lobster, I guess. Couldn't be anything else.

Seriously, the best parts of both meetings were the opportunities to renew old friendships and make a lot of new ones. I do want to thank everyone — past, present and future owners of Butler Plants—who stopped for a visit at the Butler exhibits. It's heartwarming to know there are so many friends of the products we make and of the organization that makes them.

Have any of you been up to Canada recently? They're in the most spectacular, triple-barrelled, hell-a-whippin' construction program I've ever seen. And the money to pay for it, too.

I look at the controls, artificial shortages, arguments, red tape and indecision on our side of the border and I feel we're "fiddling while Rome burns." *Canada, gentlemen, has thrown the fiddle away and picked up the trowel.*

And if they say they're going to build the St. L. Seaway alone if necessary — it ain't exhaust from an idling engine. They can do it and will — and we'll pay at their toll gate.

Sat in the audience at a T-V studio in New York. Western stuff. Girl a couple of seats over said, "What do you call that thing the cowboy's wearing — you know, that brassiere with bullets?" *Shades of Buffalo Bill! What a name for a shoulder holster!*

Yours for better roads
and more of 'em,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

Promotional Posters

MICHIGAN SILO CO., Peoria, Ill., is using a unique advertising method for promoting the use of its products, concrete and Haydite block. Posters, displaying pictures of the block and the name and address of the com-



Waste containers used to promote concrete and Haydite block

pany, are attached to the sides of waste paper containers placed in the downtown section of the city and in outlying shopping districts.

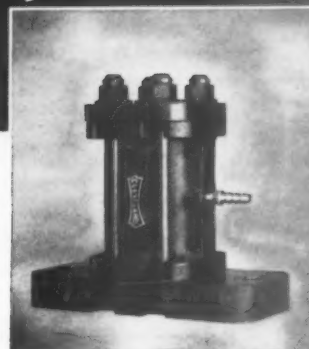
The containers belong to an advertising agency, but the city collects the waste paper. The agency keeps the containers in proper condition and each month turns the containers a fourth of the way around, giving the four different advertisers on each container the same advantage of position. Metal frames on the sides of the containers make insertion of the posters easy.

Drying of Concrete Masonry Units

FROM DATA REPORTED in Technical Report 35 of the National Concrete Masonry Association, "Effect of Elevated Temperature Drying on the Compressive Strength of Concrete Masonry Units," it appears possible to utilize accelerated drying at 240 deg. F. or less with little or no sacrifice in the compressive strength of the block, provided the block are adequately cured before drying is started.

In producing concrete masonry units, a few plants are employing artificial drying in conjunction with a two- or three-step curing-drying operation. Three-step operation consists of: (1) steam or equivalent curing, (2) a period of normal air curing and drying, and (3) accelerated drying at elevated temperatures. The two-step operation is similar except that accelerated drying is commenced immediately after the steam curing period. With this latter method it is essential

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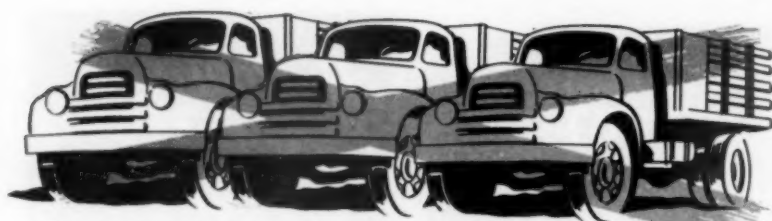
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The Rehberger Unloader does it all . . . no truck helpers are needed. As company after company has proved, your costs will go down and your profits will go up when you equip your trucks with the Rehberger Unloaders. Built for all makes of tandem axle trucks.

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to cure the block thoroughly since dry block will show little, if any, further increase in strength.

Data available in 1946 showed an 18 percent reduction in the 28-day strength of 2- x 4-in. cylinders when they were heated for 4 hr. at 200 deg. F. when 27 days old.

In other tests, cubes which were damp cured for 7 days, then heated to 572 deg. F. for 10 hr., were 12 percent weaker than companion unheated cubes.

Tests on cinder and expanded slag block showed a 5 percent reduction in strength with drying at 235 deg. F. for periods up to 7½ hr. In these tests the units were steam cured for a minimum of 16 hr.; drying was started within 2 hr. after completion of the steam curing.

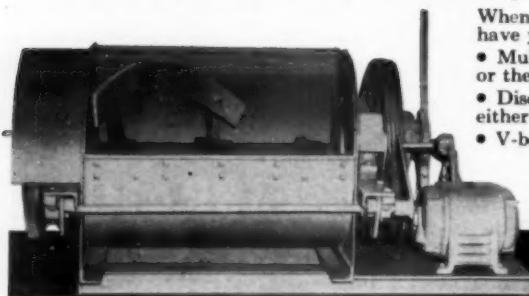
The National Bureau of Standards recently completed an investigation of lightweight aggregates in which compressive strengths of 6- x 12-in. cylinders were compared for oven-dried and non-oven-dried conditions. Different mix proportions and various types of lightweight aggregate, as well as sand and gravel, were tested. After 7 days in the fog room and 21 days in air, one set of each group of cylinders was dried at 230 deg. F.

The average strength of all oven-dried cylinders was little different from that of the set which was not dried at elevated temperatures. In fact, in some cases the oven-dried specimens proved slightly stronger than the non-oven-dried cylinders.

At the University of Wisconsin, prisms made of sand and gravel and Haydite concrete showed no reduction in compressive strength with drying at 180 deg. F. for periods up to 24 hr. applied either immediately after steam curing or at 14 days age. A series of tests on standard masonry units made with sand and gravel, Haydite, and Waylite concretes showed no loss in strength with oven drying at 14 days for 8 hr. at temperatures up to 240 deg. F.

Several N.C.M.A. members then investigated the problem with respect to 8- x 8- x 16-in. block, manufactured and cured according to the regular practice at the plant. The curing cycle

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varied between plants, but in no case was the curing period less than 12 hr. or the maximum temperature less than 150 deg. F. After being steam cured, most units were oven dried after a 14-day delay.

For expanded slag, cinders, and sand and gravel units there was little or no strength loss due to oven drying, and in some cases, strengths were increased slightly. The most noticeable strength decrease occurred in the Haydite units with delayed drying at 180 and 240 deg. F.

The report states that drying temperatures exceeding 240 deg. F. should not be used unless established as a safe practice by pilot tests. In general, it is considered safer to employ more moderate temperatures, in the 180-deg. F. range, and to avoid drying at an excessively fast rate.

Concrete Pipe Contracts

GRAYSTONE MATERIALS Co., Olympia, Wash., Seattle Concrete Pipe Co., Seattle, Wash., and Graystone Concrete Products Co., Seattle, Wash., have been awarded contracts totaling \$300,000 to furnish concrete sewer pipe for a government project at Fort Lewis, Wash.

The Olympia firm will produce some 7000 ft. of 72-in. pipe, which is the largest ever produced at that plant. The pipe will be manufactured in 6- and 8-ft. lengths. The company will also furnish 54-, 48-, 30-, 18-, 12-, 10- and 8-in. dia. pipe for the government project. The two Seattle firms will produce 60-, 42-, 36-, 24-, 21- and 15-in. pipe for the project.

N.C.M.A. Exhibit Service

NATIONAL CONCRETE MASONRY ASSOCIATION has published a 4-page folder describing a new N.C.M.A. print service to its members for use in planning exhibits for home shows, window displays, etc.

The folder contains outstanding examples of concrete masonry construction, patterned walls and construction details. Prints of the illustrations shown may be ordered in large sizes for display purposes, or can be obtained as 8- x 10-in. glossy photographs for sales-portfolios, etc. The former system of supplying prints to members on a loan basis has been discontinued.

N.R.M.C.A. Adopts Group Insurance Program

NATIONAL READY MIXED CONCRETE ASSOCIATION announces that plans for adoption of a group insurance program for the ready-mixed concrete industry are nearly complete.

In 1950, the association's board of directors authorized the appointment of a group insurance committee to study the feasibility of a group insurance program for members and their employees. The committee, consisting of Norman J. Fredericks, chairman, R. K. Humphries, Frank L. Kelly, William Moore, John W. Mur-

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The Bureau Rating Plate (1) Assures acceptance of your equipment by architects and engineers, (2) Protects you against obsolescence and departure from quality standards which have won for ready mixed concrete a market now exceeding \$500,000,000 a year, (3) Entitles you to call on the unequalled experience of Bureau members to answer your technical or other problems.

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Walnut Lane Bridge, Philadelphia. First major pre-stressed concrete bridge in the U.S.

Why do you admire this bridge?

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This is why the ready-mixed concrete industry sets exacting standards for mixer design, and certifies to you that truck mixers and agitators, built to those standards, have the proper design, capacity, drum speed and mixing action and the accuracy of water control required to produce a homogeneous concrete of uniform strength.

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THE T. L. SMITH COMPANY
Milwaukee, Wis.
WORTHINGTON PUMP & MACHINERY CORP.
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HELTZEL HELPS CONSTRUCTION DOLLARS GO FURTHER



PROBLEM: To have overhead storage of 1½", ¾", ¾" stone and run-of-crusher limestone screenings which are delivered in barges; to fill and empty the bins quickly into trucks having 14 to 16-yard capacity; to deliver aggregates in proper proportion from the same bins to an asphalt plant on a conveyor belt. These were the Nassau Docks, Inc., problems.

SOLUTION: Nassau Docks, Inc., ordered four 18-foot diameter, 150-ton capacity Heltzel bins, and at a later date, six more. A two and one-half yard clam-shell loads the bins. For discharging, double-acting clam-shell gates (16" x 16") operate from the ground level. During busy days at Nassau Docks, three or more bins are emptied per hour. The superintendent says that any one of 4 aggregate gates, or any combination of them, can be moved on the conveyor belt to the asphalt plant.

● Nassau Docks, Inc., furnishes aggregates for its own asphalt plant, for contractors and Hendrickson Brothers, with whom Nassau Docks is allied. Specialized Heltzel engineering features circular and square bins; 50-degree sloping sides of cone; a choice of clam-shell, single arc or roller gates ranging in size from 12" x 12" to 30" x 30" which are air or manually operated.

Ease of assembly is testified to by steel erectors time after time. Heltzel has solved hundreds of similar problems effectively; so why don't you write regarding your storage, loading, mixing, unloading, batching or materials handling problems?



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phy, Thomas E. Popplewell, Robert F. Porter and Frank E. Schouweiler, after an intensive study, recommended that a group insurance program should be inaugurated by the association. The recommendation was approved and the committee was authorized to investigate the kind of program which would best suit the needs of the industry.

The John Hancock Mutual Life Insurance Co. of Boston, Mass., was chosen as the insurance carrier for the program. Many legal details must first be worked out, however, before the plan can be adopted. Approval must be received from the Wage Stabilization Board and the Salary Stabilization Board, and compliance must be made with the Wage and Hour Law and with the Income Tax Law. Also, specific approval of the insurance commissioners of Texas, Ohio and Oklahoma must be obtained before the program can be launched in those states.

The insurance program will include the following employee benefits: group life insurance; group accidental death and dismemberment insurance; in-hospital (non-surgical) medical expense insurance; surgical operation expense insurance; and poliomyelitis. For dependents of employees, the coverages are: hospitalization expense insurance; in-hospital (non-surgical) medical expense insurance; surgical operation expense insurance; and poliomyelitis.

The group plan will become effective when a sufficient number of applications for the plan have been received.

V. P. Ahearn, executive secretary, listed the following reasons for the association's decision to launch a group insurance program: (a) the program, if administered through the association, would permit the use of mass purchasing power with all its obvious advantages; (b) lower insurance rates and lower net costs would be available to the participating companies; (c) members who are unable to meet the requirements for minimum number of employees required in a group program on an individual employer basis, would be able to participate under the association program; (d) the insurance program to be adopted will not require medical examinations of the covered employees; (e) group insurance programs will increase employee morale and loyalty, knowing they and their eligible dependents have adequate coverage; and (f) group insurance programs save the employer expense and difficulty which often come when death strikes, by protecting the family of the deceased employee.

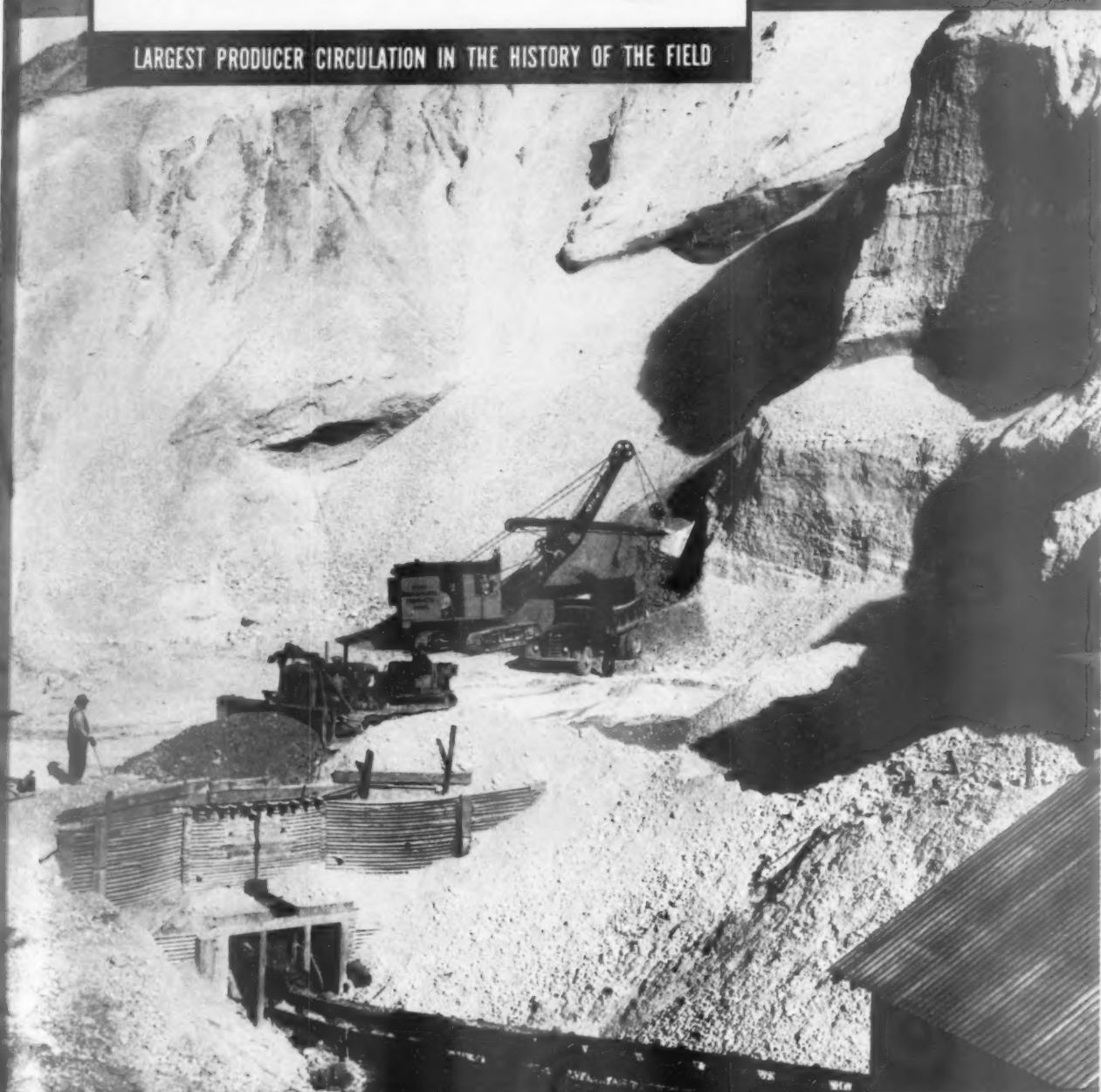
SAM BRAEN Co.'s ready-mixed concrete plant at Hawthorne, N.J., was recently destroyed by fire. Estimates of damage ranged from \$50,000 to \$100,000. Adjoining storage buildings were saved. Cause of the fire was undetermined.

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